General Practice Clinics

Vol. 6 No. 5 May 1949

REYNOLDS HAYDEN, M.D., F.A.C.S.
Editor

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(1) Joslin, E. P.: Postgraduate Med. 4:302 (Oct.) 1948. (2) Kemper, C. F.: Rocky Mountain M. J. 45:1092 (Dec.) 1948. (3) Pollack, H.: New York Med. 4:15 (Dec. 5) 1948.

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GENERAL PRACTICE CLINICS

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Published Monthly by
WASHINGTON INSTITUTE OF MEDICINE
1708 MASS. AVE., N. W., WASHINGTON 6, D. C.

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Printed in U. S. A.

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Published monthly. Each issue contains a classified subject index and author's index. A cumulative cross reference index is included in the final issue of each volume.

Subscription Rate: 1 year $5.00; 3 years $10.

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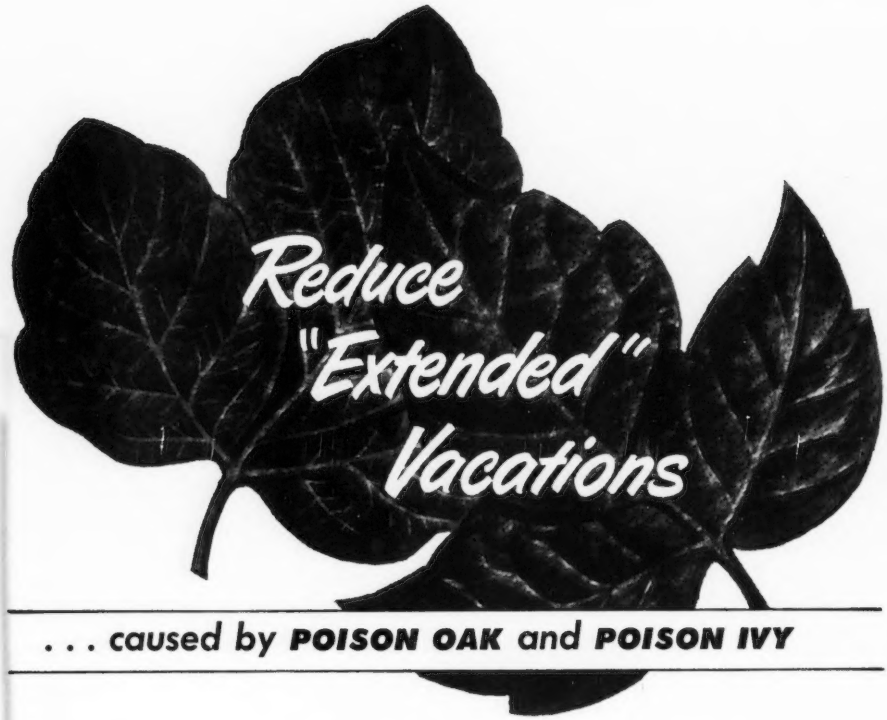
Entered as second class matter at the post offices at Washington, D. C. and Richmond, Va. under the Act of March 3, 1879.



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EDITORIAL

POLIOMYELITIS

Poliomyelitis is an acute infectious disease caused by one of the smallest viruses known. There is no evidence of racial susceptibility or immunity, the disease occurring all over the world. Moderate outbreaks appear in most countries and may be spotty or spread over extensive areas. Recognized epidemics are comparatively recent and have been chiefly in North America, Scandinavia, Great Britain and other parts of Europe. Experience during World War II showed that nonparalytic forms of the disease are widespread through the Middle and Far East. It occurs somewhat more frequently in males than in females, fatigue probably predisposing to individual susceptibility. Slight transient muscle weakness has been found in some contacts without other symptoms than slight fever and pharyngitis. Such subclinical cases undoubtedly develop immunity and are responsible for the large number of apparently normal individuals having neutralizing bodies in their blood serum. Incidence of the disease in the general population is generally considered as less than 1 per 1,000 except in severe epidemics when it may be 5 per 1,000. The incidence of paralysis in the most susceptible age group has rarely exceeded 1.5 per cent during the worst epidemics however. Most human beings of all ages, regardless of previous exposure to infection, are apparently capable of holding the virus sufficiently in check to prevent development of paralysis. The general incidence of the disease in this country does not seem to be increasing but more nonparalytic cases are being reported. About 85 to 90 per cent of cases occur in children under 10 years of age. Infants and young children were originally chiefly involved but the age incidence is now definitely changing here and in Scandinavia, especially in the 5 to 9 year group. Observations have indicated that the living conditions of the general population have a bearing upon the age incidence of the disease. There is apparently a higher immunity in the older age groups of areas having poorer sanitation. The virus seems more widespread in such areas with possibly more nonparalytic cases than in sections with improved sanitation. The weight of evidence indicates that the disease is actually more widespread in densely populated but poorly sanitated areas, though paralytic poliomyelitis is relatively uncommon among the natives. It frequently appears in foreigners coming to such areas from hygienic countries however.

There have been 18 separate strains of the poliomyelitis virus studied to date, several apparently being different immunologically, in virulence and

in resistance. The virus is quickly destroyed by heat of 50 C. for thirty minutes, strong disinfectants and oxidizing agents but resists drying, freezing, glycerin and mild antiseptics. It has been cultivated outside the body on nervous tissue from 3 to 4 month old human embryos. There is no agreement upon the most important mode of transportation, there being three principal theories, all considering man as the primary reservoir of the virus. These are the respiratory, alimentary and alimentary plus nonbiting flies. None of these explain the fact that some 90 per cent of cases and most epidemics occur during the late summer and autumn. In patients, the virus is chiefly located in certain parts of the nervous system such as the medulla and pons, spinal cord and motor cortex, and in the alimentary canal. The weight of evidence now seems to have established the fact that the portal of entry is the gastrointestinal tract through the throat and pharynx. The virus is constantly present in the walls of the pharynx and ileum and the contents but rarely the walls of the descending colon. It has been repeatedly demonstrated in the stools of more than half the patients during the first five days of the disease but in less than half the stools collected during the second week. It has also been found in feces as much as nineteen days before and six weeks or more after development of clinical evidence of the disease. It has been found in oropharyngeal swabbings of patients from two to three days before the disease developed clinically to three to five days afterwards in 50 per cent of patients under 8 years of age but in only 12 per cent of older cases. The virus has been isolated from sewage, suggesting contaminated drinking water as a possible source of infection. The value of drinking water chlorination in preventing such possible infection is doubtful as the usual residual chlorine content of municipal water supplies in this country is one-tenth to two-tenths per million for one-half to two hours and it has been demonstrated that the virus is not inactivated by five-tenths parts per million for one and one-half hours. The virus has also been recovered from flies caught near privies used by poliomyelitis patients but it is not yet possible to say that the human virus multiplies in the fly. The disease may therefore be spread from the apparently healthy carrier or from ill patients by inhalation or swallowing of infected oropharyngeal droplets; by fecal dust on fingers, toys or food; and by direct or indirect contamination of water, milk or food by carriers or flies. These facts indicate that poliomyelitis should perhaps be classified with typhoid fever and bacillary dysentery as a sanitation disease and that typhoid precautions such as disinfection of stools and utensils, screening of patients against flies, etc. should be taken with acute cases of poliomyelitis or until their stools are negative. The marked summer increase supports the theory of alimentary plus nonbiting fly transmission, while the well-known rarity of poliomyelitis in areas with poor sanitation and an abundance of flies is cited as an objection to both alimentary theories. The most convincing present evidence indicates that close contact with a carrier is the most important method of transmission.

Pathologically, various characteristic nerve cell injuries, edema and perivascular lymphocyte infiltration occur in the central nervous system, probably beginning in the preparalytic period and being associated with

the earliest evidence of virus activity. Invasion pathways from the periphery to the central nervous system and the factors limiting the multiplication of the virus in nonparalytic cases are still undetermined. Animal experiments have indicated that the host is an important factor, virus from the central nervous system of nonparalytic monkeys which had halted or prevented extension of the infection having produced the severe paralytic disease in other monkeys. The pathologic process is chiefly located in the motor nerve cells in the anterior horn of the gray matter in the spinal cord and the cranial nerve motor nuclei of the medulla, with some changes in the hypothalamus and rarely in the cerebral motor centers. A degenerative reaction occurs in the nerve cell itself and is followed by secondary surrounding changes. The earliest changes may also be the result of virus action alone without inflammatory changes. These vary considerably in different individuals, severe reactions being usually associated with extensive nerve cell destruction. Degenerative changes may be incomplete, reversible and limited or complete, irreversible and widespread. The first group is manifested clinically by the nonparalytic or transient paralytic cases and the second by the paralytic. Cortical lesions are usually limited to the motor area of the precentral gyrus and are rarely sufficiently severe to be clinically evident. Encephalitic symptoms occur in cases having the most severe inflammatory reaction in the brain stem without unusual cortical involvement. Extent of muscle weakness and temporary or permanent paralysis depends upon the amount of nerve cell injury. Destroyed nerve cells are not replaced, extent of residual paralysis being dependent upon the number of anterior horn cells destroyed. These cells and their nerve trunks degenerate and are gradually removed by phagocytic action, the corresponding muscles becoming atrophied. Less seriously damaged muscle cells may recover and again function.

Poliomyelitis apparently has an incubation period of five to eighteen days and is difficult to diagnose before appearance of the characteristic paralysis. There are three general types of the disease: abortive, nonparalytic or preparalytic and paralytic. The first, prodromal or abortive stage only has symptoms of mild pharyngitis or gastrointestinal upset with possibly some fever and malaise and is often overlooked. Diagnosis is made by finding the virus in the stools, pharyngeal washings or by positive spinal fluid findings. It was demonstrated in the Cleveland epidemic of 1947 that, except in cases having definite segmental paralytic involvement, a diagnosis of poliomyelitis cannot be made from symptoms alone but also requires an examination of the spinal fluid.[15] Persons sick with poliomyelitis may have negative spinal fluid but such instances are rare. In the second or preparalytic stage, the symptoms of the first stage are intensified but may be separated from the first stage by a few days freedom from fever and other symptoms. There may be high fever, severe headache, nausea and vomiting. The abdominal symptoms sometimes so resemble acute appendicitis that an appendectomy is done. First signs of central nervous system involvement appear with slight stiffness of the neck and back. Anterior flexion usually causes severe pain and bed patients have difficulty sitting up because of stiffness of the back,

supporting themselves by placing their hands on the bed behind them. The deep reflexes are usually hyperactive during the preparalytic stage but become unequal or absent with onset of paralysis. The spinal fluid is sterile with increased cell count, globulin or total protein and normal sugar. Patients may be drowsy when undisturbed but alert, sensitive and irritable when disturbed. Pain and tenderness in the muscles of the neck, back and extremities may appear. Pressure over the spinous processes, especially the cervical, frequently reveals tenderness. Hyperesthesia is a common early symptom and is revealed by the lightest touch or by deep pressure along the spine or large nerves. A Babinski sign has been noted in the preparalytic stage and usually indicates a meningitic form of the disease. Tremors usually develop late in the preparalytic stage and generally indicate beginning paralysis. The patient may make a gradual recovery or paralysis may develop. The differential diagnosis of this stage may be somewhat difficult in an epidemic, almost everything being suspected of being poliomyelitis. Severity of early symptoms and febrile reactions apparently bears no relation to the outcome, the prognosis depending upon development of paralysis. From 50 to 80 per cent of cases in an epidemic are nonparalytic. The third or paralytic stage usually appears on the third or fourth day of illness, or of the second febrile period in the dromedary type. The temperature becomes normal as paralysis develops. Involvement of 1 leg occurs in about 25 to 30 per cent of patients, both legs in about 20 per cent, both legs and arms in about 10 per cent, and 1 arm or the face in about 6 per cent. The spinal form is the most common paralytic type, paralysis being followed by slow development of muscle atrophy or contraction and very slow functional return over a period of months. The respiratory system may be involved through paralysis of the intercostal muscles or diaphragm, involvement of the respiratory center or pharyngeal paralysis and is the most dangerous. A gradual ascending paralysis may develop and become fatal through involvement of the respiratory muscles and medullary centers of respiration and circulation. Other varieties included in the paralytic stage are the bulbar, bulbar-spinal and bulbar-encephalitic. These have a more precipitous onset and more severe preparalytic symptoms than the spinal cases. Statistics show an increased incidence of bulbar poliomyelitis soon after tonsillectomy. That operation is therefore inadvisable in the presence of an epidemic of poliomyelitis or when endemic cases are occurring. Development of symptoms of bulbar involvement such as respiratory difficulty, fluctuating blood pressure and inability to swallow indicates a grave prognosis. Hemorrhagic pulmonary edema is often the immediate cause of death. Early diagnosis of brain stem involvement may mean the difference between life and death. Bulbar-spinal cases involve both brain and cord and have corresponding symptoms. In the bulbar-encephalitic type, both the cerebrum and brain stem are involved, symptoms being excessive restlessness and apprehension or drowsiness and disorientation. Sequelae of the bulbar varieties have been found to be not uncommon, usually nasal regurgitation from involvement of the soft palate. Nasal type voice changes are also frequent while facial asymmetry occasionally follows facial nerve paralysis.

Recovery from these sequelae corresponds to that of moderately paralyzed limbs. Little or no improvement occurs beyond six to nine months after the acute stage.

There is no specific treatment for poliomyelitis. The preparalytic stage is largely treated symptomatically as the virus has already invaded the central nervous system by the time the disease is recognized. Convalescent human serum has been used extensively but its popularity is diminishing. Its value is difficult to determine because paralysis may or may not develop. It is doubtful if it can be given early enough to prevent or check damage. No prophylactic vaccine has been developed, though some investigations have indicated promise in the use of vaccine made from poliomyelitis virus killed by ultraviolet light. Chemotherapeutic agents, antibiotics, globulin fractions and the new physical therapies have been ineffective. The disease runs a variable course of three to five or seven days after the nervous system becomes involved. Regeneration then commences and becomes nearly or fully completed in about six weeks. Treatment consists primarily of supportive and life saving measures for patients having respiratory, upper spinal, brain stem or medullary involvement. Improved treatment of respiratory or bulbar involvement is important as these cause most deaths from poliomyelitis. Complicating pneumonia is treated by chemotherapy or antibiotics. Early oxygen therapy has been found helpful in some cases of bulbar involvement who have difficulty obtaining a good respiratory exchange even when in the respirator but does not aid the excretion of carbon dioxide. Atelectasis is a frequent complication of cases having respiratory difficulties. The first symptom is usually difficulty in breathing, restlessness and anxiety. Diagnosis is made by clinical and roentgenologic findings. Patients developing atelectasis in respirators are unable to cough adequately, have pain in the chest and may be in shock or deeply cyanotic in spite of oxygen. Prompt and adequate treatment is essential. Prevention is best, protecting patients in respirators from persons having an upper respiratory infection and actively treating such an infection with chemotherapy or antibiotics. Immediate bronchoscopy with removal of the obstruction by suction is essential for recovery. Cause of the dyspnea must be established in cases having respiratory difficulty. Mechanical obstruction must be eliminated by clearing the nasopharynx of all secretions and foreign matter. Continued dyspnea indicates involvement of the central or peripheral nervous system. Regular respirations without change in the patient's color indicate the latter. Increased restlessness and cyanosis indicate immobilization of the ribs and/or diaphragm, while irregularity in the rate or depth of respiration indicates involvement of the respiratory center. The respirator benefits all patients except the central respiratory type. Reliance on oxygen alone without close observation and symptomatic treatment as necessary may do more harm than good. Symptomatic treatment is more important in bulbar poliomyelitis than in any other acute type. Pharyngeal paralysis is usually temporary and the patient will recover from it if he can be kept alive four or five days. Postural drainage is essential, the head being at least a foot below the feet. Lying on the side or on the face with head turned to one side

is often beneficial. Aspiration of the throat is necessary if posture does not give adequate drainage. This must be done with an effective apparatus having a suction tip and operated at a pressure which is not traumatizing. Too frequent and vigorous aspiration may frighten the patient and cause nausea and retching. Neither food nor fluids should be given these patients orally or by gavage as they have a marked tendency to vomit with resulting cyanotic attacks. Adequate maintenance of body fluids may be accomplished by rectal or parenteral administration during the acute stage. An intravenous drip is useful but must be used cautiously in order not to give too much fluid. Gavage should not be used until the patient passes the danger stage and is afebrile. Tracheotomy may be necessary in these cases and should be performed if postural drainage and aspiration do not keep the airways clear, before it becomes necessary as an emergency measure or last resort. Tracheotomy should be done under anesthesia to avoid excitement. Avertin has been excellent for children. Laryngeal paralysis is rare, difficult to diagnose and requires tracheotomy for adductor paralysis.

Sedatives such as morphine or barbiturates are dangerous in these cases as the patient cannot be allowed to rest while every respiration must be calculated. Atropine is considered dangerous because it makes the secretions thick, sticky and difficult to remove. Neostigmine has been found of little benefit. Administration of curare temporarily relieves tight mucles but has no effect upon the course of the disease. It is dangerous and should only be given by persons trained it its use. Rosenberg and Fischer[5] report that it actually made patients worse in a test series of cases, causing paralysis of normal muscles which were antagonists of spastic muscles unaffected by the drug and preventing effective physiotherapy. Paralysis of the bladder is occasionally a serious complication which was promptly relieved in 70 per cent of 36 cases by a new parasympatheticomimetic drug Furmethide (furfuryltrimethylammonium iodide) given subcutaneously in 1.5 to 5.0 mg. doses according to age.[10] Spontaneous voiding usually occurred in five to ten minutes after the first dose. The drug may be repeated if necessary. Experience in this short series of cases showed that it eliminated the need for catheterization in the majority of cases. Relief of pain and spasm is a major problem in treatment of poliomyelitis. Oscillometric tests indicated that vascular spasm was present in partially or completely paralyzed extremities. These are believed to be the result of a series of abnormal spreading reflexes produced by impulses released as a result of inflammation of the gray matter of the spinal cord. In a preliminary report, Emil Smith, D. J. Graubard et al.[3] report that treatment of a series of 79 such cases with intravenous procaine hydrochloride, oral or intramuscular Priscol hydrochloride, or oral Diethylaminoethanol hydrochloride gave relief, procaine giving the quickest and Diethylaminoethanol the slowest. Further administration produced complete relief in one to fourteen days. Acute pain did not continue over twenty-four hours. No deleterious side effects were noted but course of the disease was apparently shortened and residual effects diminished. Further studies concerning use of these drugs are being made. The chief

treatment of poliomyelitis is prevention of deformity of weakened muscles by protecting them against normal or shortened antagonists, followed by intensive, supervised physical therapy to help involved muscle groups recover maximum strength. All motion of involved parts must be gentle. Hot packs are used to ease spasms which are in themselves deforming. These may be applied several times a day but usually only to local areas of spasm. Gentle passive motion exercises are performed several times daily. Parts are kept in the most favorable position and supported as indicated. Support to the feet is especially necessary. Pulling the mattress away from the foot of the bed permits the foot to be kept at a right angle while the patient is prone. Parts should not be kept in one position for long periods but wire or bivalved plaster splints may be used when it is hard to control a deformity and especially to support the feet. Estimates of muscle function should be made after the temperature has been normal forty-eight hours and repeated regularly to record progress of recovery. Active guided exercises are based on these estimates and are used early. It is quite important to maintain the action of paralyzed muscles by exercises during the stage when recovery is possible. Muscle substitution must not be permitted, the therapist assisting the weak muscle motion if necessary but the patient making every effort to move it. Underwater treatment and exercises are valuable in both the sensitive stage and later convalesence. It decreases spasm and sensitivity, corrects deformities and helps develop a range of motion. Stretching of the contracted parts is often necessary after the insensitive convalescent stage is reached.

Finally, the patient is taught how to best use what he has left so that he may become self sufficient. This now usually consists of some modification of the Kenny system. The chief difference between the Kenny treatment and standard present day therapy is that muscle reeducation and passive motion of the extremities is started earlier in the former and immobilization is much more complete in the latter. The Kenny method treats contractures by hot applications and tendon stretching rather than by corrective apparatus. Review of available articles and specific figures show quite similar clinical results from each method. The mortality rate has averaged less than 5 per cent over many epidemics. End results have varied somewhat. An average of 20 to 25 per cent of all cases have a varying amount of permanent paralysis but only about 5 per cent of these are so disabled that they cannot become self sufficient over a period of time. The Kenny theories are not generally accepted in their entirety and statistics from the Kenny Institute do not prove that method to be superior. The Kenny treatment seems more comfortable for the patient and keeps the peripheral tissues in better tone, probably facilitating recovery of muscle tone. Newer theories of the cause, prevention and treatment of poliomyelitis based upon the controlled clinical work have so improved the outlook that there are brighter prospects of conquering the disease. Muscle reeducation will restore function but requires constant, whole hearted and patient supervision by personnel specially trained in physical therapy until the patient is ready for orthopedic treatment. It requires much time and is best given in an institution. Physical

therapy which is only supervised during occasional visits is practically useless. Most of the work done by the National Foundation for Infantile Paralysis is financed with funds from the annual March of Dimes.

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The Miami Herald-Chicago Daily News Wire Service reports that inception of the present New Zealand medical scheme in 1939 had a remarkable effect upon New Zealanders. The nation seemed to develop more ills overnight than ever before in its history. Doctors were overrun, drug stores trebled their prescriptions, and family medical lockers were loaded with bottles and boxes. Sick benefits only cost the government $5,700,000 in 1939 but the new medical program cost $200,000,000. in 1946-47. The government of Australia made a list of some 600 approved medicines to be dispensed free by doctors on special government prescription forms. Only a few doctors prescribed free medicine and the public seemed to feel that the plan is not free because they pay taxes to support it.

MEDICINE

The Clinical Administration of Dihydrostreptomycin in Tuberculosis. A Preliminary Report. *H. Corwin Hinshaw, Wm. H. Feldman, David T. Carr and Henry A. Brown, Mayo Foundation and Clinic, Rochester, Minn.* Am. Rev. Tuberc. 58:525-30, November 1948.

After the efficacy of dihydrostreptomycin against experimental tuberculosis had been demonstrated, an investigation to determine its clinical possibilities was commenced early in 1948. Although comparatively few patients have been treated, a preliminary report of results is made because they have been sufficiently uniform to indicate that the drug has certain advantages over streptomycin. Dihydrostreptomycin was given 14 patients, 13 having various types of tuberculosis. The doses used varied from 1 to 3.2 Gm. daily for ten to one hundred and twenty days. It is believed that symptoms of drug toxicity would have developed had similar doses of streptomycin been administered. Severe nerve damage only occurred in 1 of the 14 cases. This patient received 2.8 Gm. streptomycin daily for eight days when it was stopped because of symptoms of early and acute vestibular nerve damage. Streptomycin was again given in 2 Gm. daily doses fourteen days later but stopped after three days because of severe vertigo. Dihydrostreptomycin 3.2 Gm. daily was commenced six weeks later. Severe dizziness developed after twenty days, the previously normal labyrinths being very sluggish after completion of treatment. Renal insufficiency was also manifested with a blood urea of 140 mg. per 100 cc. of blood. The blood level of dihydrostreptomycin was found to be 320 micrograms per cubic centimeter of serum. Another patient developed symptoms of mild vestibular dysfunction after taking 3 Gm. of the drug daily for forty-two days. The symptoms disappeared a week after treatment was stopped but caloric tests showed a moderately hypoactive vestibular apparatus. Neither subjective nor objective symptoms of nerve damage developed in any of the other 12 cases, negative results being obtained with Kobrac's vestibular function test done about every two weeks on all patients during treatment and at the completion of all but 1 case which finished treatment elsewhere. Differential weekly blood counts on all these patients showed no eosinophilia in excess of 5 per cent. No drug rash nor other indication of allergic response to dihydrostreptomycin appeared, while 1 patient who was quite sensitive to streptomycin tolerated dihydrostreptomycin well. Liver function tests showed no evidence of hepatic damage from the drug. Repeated urinalyses, blood urea determinations, hemoglobin estimations and weekly red, white and differential blood counts showed no evidence of renal or hematopoietic abnormality. No gastrointestinal symptoms could be clearly attributed to dihydrostreptomycin but 2 patients had gaseous dyspepsia which stopped when treatment was discontinued.

Three cases of tuberculous meningitis were given dihydrostreptomycin 50 mg. intrathecally every forty-eight hours but the treatment had to be stopped after two to fourteen injections because of evidence of spinal cord irritation and cerebrospinal fluid block. The dihydrostreptomycin used in these cases seemed to produce more pain and soreness than did streptomycin at the site of intramuscular injections and patients who had received both drugs agreed that dihydrostreptomycin was the more irritating. Recent new lots of dihydrostreptomycin from the same manufacturer appeared to cause no more irritation at the injection site than did similar amounts of streptomycin. These facts indicate that dihydrostreptomycin is effective treatment for some types of clinical tuberculosis. Its activity is probably similar to streptomycin but it is definitely less than streptomycin in similar doses and may be given in 2 to 3 Gm. doses daily for sixty days or perhaps more with slight risk of disturbing the organs of equilibrium. Intrathecal injections of dihydrostreptomycin are not recommended unless a less irritating form of the drug is produced. It is suggested that meningitis cases treated with dihydrostreptomycin might be given purified streptomycin intrathecally. 3 references. 1 table.

A Clinical and Experimental Study of Isuprel in Spontaneous and Induced Asthma. *Francis C. Lowell, Boston University School of Medicine, Boston, Mass., John J. Curry, Georgetown University School of Medicine, Washington, D.C. and Irving W. Schiller, Boston University School of Medicine, Boston, Mass.* New England J. Med. 240:45-51, Jan. 13, 1949.

The effects of Isuprel in asthmatic patients and in connection with experimental studies of asthma-like attacks produced by histamine, methacholine and certain allergenic extracts are discussed. The drug was usually administered as an aerosol but also sublingually and subcutaneously. Aerosol administration was in 1 and 0.5 per cent concentrations. Injections were 0.02 and 0.01 per cent solution and oral or sublingual administration was in tablets containing 10 mg. Aerosol. Administration outside the hospital was by the vaponephrin nebulizer or the No. 40 De Vilbiss nebulizer with a hand bulb. They were used in hospitals by attaching them to an oxygen tank adjusted for a flow of 6 to 8 liters per minute. A group of 30 asthmatic patients treated themselves with a 0.5 per cent Isuprel solution at home, excellent relief being obtained by 10, good relief by 14, fair relief by 3 and practically no relief by 3. This method of treatment was stopped and other procedures used if neither subjective nor objective improvement followed continued administration. Isuprel aerosol was frequently found effective in milder attacks when unsuccessful in more severe attacks. Isuprel was only effective in mild attacks in 10 of the 14 patients who obtained good relief from the drug. Ten of a group of 12 patients with severe asthma required intravenous aminophylline, repeated sedatives including demerol, glucose and saline infusions, epinephrine or sometimes oxygen with or without helium. Studies of the effects of parenteral and aerosol administration of Isuprel in preventing reduction in vital capacity and asthma-like attacks from parenterally administered histamine and methacholine indicated that

Isuprel supplies adequate protection. Isuprel was administered sublingually to 13 patients, one 10 mg. tablet being taken every thirty minutes until relief was obtained or until 4 tablets were taken in any one day. Side effects which might be attributed to Isuprel only appeared in 2 of 30 asthmatic patients. These each experienced nervousness, tachycardia and palpitation but only for a few minutes. No side reactions except a bitter taste followed sublingual administration. Isuprel was given subcutaneously or intramusularly to 5 patients, side reactions of nervousness, tachycardia and palpitation occurring in 2 cases. One also had pallor and fall in blood pressure. These studies indicated that aerosol Isuprel was the most effective self medication available for asthma, being especially effective in mild or moderately severe attacks. 4 references. 1 table. 1 figure.

"Aureomycin" a New Orally Effective Antibiotic. Clinical Trial in Rocky Mountain Spotted Fever, Results of Susceptibility Tests and Blood Assays Using a Turbidimetric Method. *George T. Harrell, Manson Meads and Kingsley Stevens, Bowman Gray School of Medicine of Wake Forest College and the North Carolina Baptist Hospital, Winston-Salem, N. C.* South. M. J. 42:4-12, January 1949.

Aureomycin is in the same general class of antibiotics as streptomycin since it is produced by a species of actinomyces. The term "duomycin" has also been used because in vitro experiments indicate that the drug is active against both gram-positive and gram-negative bacteria. Gram-positive cocci appear to be appreciably more affected by the drug than the tested gram-negative bacilli. On oral administration aureomycin is absorbed from the intestinal tract, passes into the cerebrospinal fluid and is excreted through the kidney slowly. It seems to be relatively nontoxic whether administered orally or parenterally. The diseases which have been effectively treated are endemic typhus, rickettsial pox, Q fever and Rocky Mountain spotted fever. The drug was used in 3 unselected, consecutive cases of Rocky Mountain spotted fever, intensive supportive therapy also being given. All recovered. For this disease the parenteral dose of aureomycin should probably be about 5 to 10 mg. per kilogram per day (1 patient, an 8 year old child, received 40 mg. every six hours, intramuscularly, for about seven days). Orally the daily dose appears to be 50 to 100 mg. per kilogram (3 to 6 Gm. daily for an adult) every four to six hours. These patients should receive aureomycin for two to three days after the temperature reaches normal since the drug evidently acts by reducing the number of organisms in the body to a point where a low degree of immunity is clinically effective. The apparent low toxicity makes the institution of therapy on suspicion of rickettsial spotted fever safe. Since aureomycin quickly loses activity if in solution at physiologic *p*H and temperature ranges, this characteristic must be taken into consideration when laboratory tests of the susceptibility of bacteria and levels of activity in body fluids are interpreted. The fact that the drug is usually buffered on the acid side makes parenteral injections somewhat painful but the addition of procaine to the solution reduces the discomfort. Aureomycin is bacteriostatic in low concentrations and bacteriocidal in high concentrations. The mech-

anism of action is similar to that of penicillin. Since the submission of this paper 26 other cases of Rocky Mountain spotted fever have been treated with aureomycin, a favorable response being obtained in 25 cases. 9 references. 1 table. 4 figures.

Aureomycin in the Treatment of Experimental Relapsing Fever and Leptospirosis Icterohaemorrhagica (Weil's Disease). *Fordyce R. Heilman, Mayo Clinic, Rochester, Minn.* Proc. Staff Meet., Mayo Clin. 23:569-73, Dec. 8, 1948.

Mice were infected with a strain of relapsing fever spirochetes, Borrelia novyi, and treated with various doses of aureomycin. When mice with established infections were treated with three subcutaneous injections per day for three days, the daily dose containing 0.18 mg., the blood was cleared of spirochetes within twenty-four hours and there were no relapses. Two doses given orally six hours apart and containing a total of 1 mg. of the drug, also were effective. Comparison of these results with those obtained in previous experiments with penicillin indicate that on the basis of weight, aureomycin is approximately three times as active as crystalline penicillin in the treatment of this type of experimental infection. Syrian hamsters were infected with lethal doses of Leptospira icterohaemorrhagiae and treated with two subcutaneous injections of aureomycin per day. Treatment was started twenty-one hours after infection and was continued for ten days. Total daily doses of 0.125 mg. gave complete protection. Comparison of these results with those secured in previous studies with penicillin in the treatment of this type of experimental infection indicate that on a weight basis aureomycin is at least twice as effective as crystalline penicillin. 8 references.—*Author's abstract.*

A New Treatment for the Relief of Obliterative Diseases of Peripheral Arteries. *Isidor Mufson, College of Physicians and Surgeons, Columbia University and Presbyterian Hospital, New York, N. Y.* Ann. Int. Med. 29:903-13, November 1948.

The fundamental purpose of the treatment of the obliterative peripheral arterial diseases is to dilate the available collateral arterial system. It has been proved that the generalized vasodilatation which develops from the use of intravenous and intramuscular injection of vasodilating drugs, defeats this purpose. The uninvolved extremities, usually the upper half of the body, respond promptly and abstract blood from the involved and unyielding arteries of the lower half of the body. This has been proved by studies on blood flow in which radioactive sodium is utilized. Only the introduction of the vasodilators through the cognate artery of the involved extremity can fulfill the objectives of treatment. The collaterals in the involved extremity are dilated and the differential between the pressure in them and the aorta is widened and blood flow is increased only where it is needed. The rapid injection of vasodilators into the artery fulfills this objective only partially because it rushes through into the general circulation where it acts like a vasodilator injected intravenously. Given slowly, an intra-arterial drip of a dilute solution fulfills the postulates enumerated especially if the vasodilator

is hydrolyzed rapidly and little or none is left to return into the general circulation. Histamine is such a drug and the intra-arterial infusion of this drug in dilute solution (1 mg. histamine base in 500 cc. normal saline) will induce a local vasodilatation, flushing of the skin of the extremity, raising its surface temperature, dilating the superficial veins and increasing the diffusion of radioactive sodium. Its effect on walking tolerance has been very good to good in 84 per cent and failed in 16 per cent of the cases treated. Its effect on the pain occurring during sleep in the horizontal position has been almost invariably good. Extravascular spasm resulting from painful lesions and fear can diminish the vasodilating effects of histamine. In conclusion, therefore, histamine, when a collateral circulation is available and in the absence of uncontrollable causes of vasospasm, can improve the walking and sleep tolerance of the patient with obliterative arterial disease due to embolism, arteriosclerosis and thromboangiitis obliterans. 5 references. 2 tables. 3 figures.—*Author's abstract.*

Tentative Appraisal of Vitamin B_{12} as a Therapeutic Agent. *Tom D. Spies, Birmingham, Ala., Ramon M. Suarez, San Juan, P.R., Guillermo Garcia Lopez and Fernando Milanes, Habana, Cuba, Robert E. Stone, Birmingham, Ala., Ruben Lopez Toca and Tomas Aramburu, Habana, Cuba, and Sam Kartus, Birmingham, Ala.* J. A. M. A. 139:521-25, Feb. 19, 1949.

Vitamin B_{12} is the most recently discovered and effective antianemic substance known. It is also the only chemical which effectively relieves subacute combined degeneration in cases of pernicious anemia. Results of investigations of its effects upon blood regeneration in 14 patients with tropical sprue, nutritional macrocytic anemia and pernicious anemia, and upon subacute combined degeneration in pernicious anemia are summarized and a typical case history presented. Accurate diagnosis was essential in this investigation. Each patient was proved to have macrocytic hyperchromic anemia, a red blood cell count of 2,500,000 or less, a color index of 1.0 or more and megaloblastic arrest of the sternal bone marrow. Controlled administration of vitamin B_{12} to these patients produced marked clinical improvement with increased reticulocytes, red blood cells, platelets and hemoglobin. Patients stated that they felt stronger between the third and fifth day after the vitamin B_{12} injection and that their appetites had returned. A table showing the characteristic hematolytic response is given. Symptoms of subacute spinal cord degeneration in cases of pernicious anemia improved and the severe glossitis sometimes present in macrocytic anemia healed dramatically after administration of vitamin B_{12}. The abdominal distention and volume of stools in cases of sprue diminished and the stools tended to return to normal.

The dosage of vitamin B_{12} varies considerably with the individual patient. Some benefit has followed the injection of only 4 micrograms and 10 micrograms has had no effect. Most patients show a minimal response to 8 to 10 micrograms while the average patient probably gives the best response to 100 micrograms or less. The reported case had manifest disturbances of locomotion and impaired use of her hands. She could not get up from a sitting position and walk without help and had great difficulty in picking

up and manipulating small objects. She received 25 micrograms of vitamin B_{12} parenterally followed by the same amount intramuscularly at the end of each twenty-four hours for a total of 5 doses. She was able to walk unassisted on the fourth day of treatment and had touch and pain sensation in her extremities on the fifth day. She walked well on the tenth day and no longer had a positive Romberg sign. On the twenty-sixth day, her R.B.C. had increased from 2,050,000 to 3,040,000 and her hemoglobin from 9.3 to 10.5 Gm. Vitamin B_{12} has been found ineffective on the leukopenia of infections, drug idiosyncrasies, idiopathic purpura, secondary anemias, aplastic anemia or leukemia. Careless diagnosis and casual treatment cannot be tolerated when using liver, liver extract, ventriculin, folic acid or vitamin B_{12} therapeutically. The principles used in treating any of these syndromes of macrocytic anemia are to make early and positive diagnosis; promptly commence intensive and persistent treatment; administer slightly more of the medication than just necessary to maintain a normal blood level; give a rich protein diet; and promptly treat all associated diseases or complications. 12 references. 1 table. 3 figures.

Combination Promin and Streptomycin Therapy for Tuberculosis *H. Vernon Madsen, Ottawa, Ill.* Dis. of Chest 14:850-52, Nov.-Dec. 1948.

Antibiotics have been assuming a greater place in the armamentarium for the treatment of tuberculosis, dosages on these drugs have been erratic, and the combinations are assuming more and more importance. While streptomycin was still unavailable to general practitioners, a case of renal tuberculosis presented itself and was treated with promin alone. The excellent results obtained later suggested to the author that a combination of this with streptomycin might be worth while. This combination was used in many cases of pulmonary tuberculosis and in 2 other cases of renal tuberculosis. The dosage used was as follows: Streptomycin was given for a two week period and then the patients were given a week of rest without treatment. Then streptomycin was given in 0.25 Gm. dosages twice daily. This regimen was continued until approximately 60 Gm. of streptomycin had been given. During the time the streptomycin was administered, 2 Gm. of promin were also given intravenously by one injection daily. This was given for a six day period and omitted the seventh day. Then it was given again for six days, followed by an eight day rest. This regimen was continued during the period the patient was on streptomycin therapy. Case histories are presented on 3 cases of renal tuberculosis, all treated with promin and all obtaining excellent results. The author also notes that other types of tuberculosis were treated by this same program, and that it was his impression that results were fully as good as when treated with larger doses of streptomycin alone. In summary, it is noted that the cases were presented to stimulate interest in the use of streptomycin and promin as a combination in the treatment of tuberculosis and especially in the treatment of renal tuberculosis. The author notes that the series of cases presented was small and the period of treatment short; therefore the results are merely suggestive of a new trend in thought which might be worthy of further consideration by other clinicians.—*Author's abstract.*

ALLERGY

The Clinical Evaluation of a New Antihistamine Agent "Trimeton". A Conjoint Study of 227 Patients. *Ethan Allan Brown, Boston, Mass.* Ann. Allergy 6:393-97, July 1948.

Trimeton (prophenpyramidine) was administered by 12 physicians to 227 patients seen in their private practices and in the Allergy Department of the Boston Dispensary. The drug was administered in doses of 6.75 to 50 mg. one to four times daily. The patients were classified in the following groups: allergic coryza, vasomotor coryza, bronchial asthma, atopic eczema, urticaria, angioneurotic edema, contact dermatitis, acute infectious coryza, migraine, exfoliative dermatitis, radiation sickness, acne rosacea, generalized pruritus and various combinations of these syndromes, two or three conditions sometimes being present in the same patient. Of the 90 patients presenting typical allergic coryza, 62 reported excellent (complete) relief and 19, satisfactory relief. In 9 there was little or no effect. In 12 patients there was slight, transient drowsiness. Seven patients reported moderate side reactions. In only 1 patient were the side reactions severe. In 26 patients with vasomotor coryza, 11 reported excellent and 7, satisfactory relief. In 8, there was no effect. Mild drowsiness was present in 2 subjects and moderate in 1.

Fifteen of 25 patients with mild extrinsic bronchial asthma reported excellent and 5, moderate relief. Some took supplementary medication. They differ from the remaining patients in that they were being actively treated to a much greater degree with dust elimination and other forms of adjuvant therapy. Mild reactions occurred in 5 and moderate reactions in 1. Eight patients with intrinsic bronchial asthma associated with infection were given Trimeton, with excellent relief in 3, and satisfactory relief in 1. In this group there were no side reactions. Of the 22 patients with urticaria, 15 were completely relieved and 3, moderately so. Three patients with urticaria and angioneurotic edema were all completely symptom-free. Only 2 patients in this group complained of mild side reactions. In 7 patients with atopic eczema the pruritus was completely controlled and moderately so in another 3. In 1 patient there was no effect. Although the groups studied include syndromes not usually treated successfully with antihistaminic agents, 61 per cent of the group was completely relieved of their presenting symptom and 22 per cent were satisfactorily relieved, a total of 83 per cent. Reactions of any degree, chiefly drowsiness, occurred in only 6 per cent of the patients studied. 3 references.—*Author's abstract.*

A Fall-Pollinating Red Berry Juniper. *A. Ford Wolf, Temple, Tex.* Ann. Allergy 6:431-34, July-Aug. 1948.

The article describes a cedar which is distributed over parts of central and west Texas, southwestern Oklahoma and southeastern Arizona. It has been identified as Juniperus pinchoti (Sudworth), or red berry juniper. It closely resembles J. ashei but it pollinates from the latter part of September to early in December and is introducing another pollen season in the areas

involved. The cedar promises to become more profuse and more widespread due to the fact that it regenerates from the roots and cannot be killed by above the ground destruction. It is similar antigenically to J. ashei and is a significant cause of hay fever.—*Author's abstract.*

The Use of Placebos in the Local Therapy of Skin Diseases. *E. W. Abramowitz, New York Post-Graduate Hospital and Medical School, New York, N. Y.* New York State J. Med. 48:1927-30, Sept. 1, 1948.

A placebo is defined as a material which is effective by the mechanism of suggestion. It is a temporary, chemical, psychotherapeutic device. There are pure and impure placebos. Both types have their place in the local therapy of skin diseases. If the eruption is of a psychologic etiology more skilled psychotherapy may be required either by the dermatologist or by the psychiatrist. Certain patients cannot receive placebo therapy because of their negative attitude towards the physician. However, many prescriptions with active ingredients also contain placebo elements. 3 references.—*H. Abramson.*

(This is a most unusual article showing exceptional insight into the mechanism of the unconscious in local dermatologic therapy and should be read by anyone practicing allergy.—ED.)

Histamine Treatment of Foreign Protein Type Reactions. *Homer E. Prince and Richard L. Etter, Houston, Tex.* Ann. Allergy 6:386-92, July-Aug. 1948.

A report of 9 cases of established foreign protein type reactions, due either to penicillin or tetanus antitoxin, have been reported, all showing the classic signs of anaphylactoid type reactions. Most of these cases had received prior treatment with antihistaminic drugs without results. The cases were treated with either intravenous or intradermal histamine, the intravenous given as histamine acid phosphate, 2.75 mg. in 250 cc. of diluent or a multiple thereof. The intradermal histamine was given at hourly to daily injections, after titration to determine the correct dosage to produce an adequate, prolonged, generalized flushing. All cases treated in this manner showed good clinical response. 5 references. 1 table.—*Author's abstract.*

Studies in Dysentery Vaccination. IV. Primary Vaccination of Children with Monovalent Vaccines of Shigella. *M. L. Cooper, J. Tepper and H. M. Keller, Childrens Hospital, University of Cincinnati, Cincinnati, O.* J. Immunol. 60:189-203, October 1948.

Adolescents of 13 to 19 years of age were injected with nonviable suspensions of Shigellae in various doses and by various routes. Vaccines of Sh. paradysenteriae types III, II, VII, I, VI and of Sh. sonnei and Sh. ambigua were employed. Response was recorded in terms of agglutinative titers and mouse protection as described in previous publications. Significant increases in circulating antibody were seen with every type or species, which reach under optimal conditions several hundred times the pre-immunization values. Intravenous injection with small doses (for instances 10^8 organisms) resulted in good response but also in heavy side reaction in form of fever,

vomiting, etc. By subcutaneous and intradermal application much higher doses were needed but were also much better tolerated. Repeated injections of several billion organisms were needed to give optimal response. The specificity of the antibodies was roughly what would be expected on the base of available information on cross reactivity of Shigellae. 19 references. 5 tables.—*A. J. Weil.*

Cholera Immunization. *E. Singer, S. H. Wei and S. H. Hoa, National Institute of Health, Nanking, China.* J. Immunol. 60:181-87, October 1948.

Suspensions of Vibrio cholerae, killed at 56 C. and phenolized, killed at 100 C. and phenolized, and killed with 0.3 per cent formol and phenolized, respectively, were compared for immunizing power in man, the measure being serum agglutination. No significant differences were observed. Intracutaneous injection of three doses of 0.1 to 0.2 ml. were slightly more effective than three subcutaneous doses of 0.5 to 1.0 ml. The serums of these human subjects had a protective effect in the test on isolated guinea-pig ileum comparable to that of rabbit immune serums. 1 reference. 3 tables—*A. J. Weil.*

On the Significance of Hr Sensitization in Rh Antibody Determinations. *Roy T. Fisk and Albert F. Brown.* Am. J. Clin. Path. 18:716-18, September 1948.

Although sensitization to the Hr factors is so uncommon compared to Rh that routine Hr typing of pregnant women is not necessary, the authors present evidence that the Hr′ factor is not necessarily a poor antigen. Their report is concerned with a mother who became sensitized during her first pregnancy without history of previous exposure to the antigen. Her Hr antibodies led to the severest types of erythroblastosis in her twin infants who, although presumably subjected to the same maternal antibody, developed pathologically dissimilar forms of this condition. One of the infants had the hydrops type and the other the icteric. 4 references.—*M. Scherago.*

Thephorin. An Experimental and Clinical Evaluation in Allergic States. *L. H. Criep and T. H. Aaron, Pittsburgh, Pa.* J. Allergy 19:304-12, September 1948.

Thephorin, a new antihistaminic drug, has been found to have good antihistaminic and antianaphylactic properties. The authors have carried out toxicity studies on 37 patients with detailed laboratory findings. In addition, whealing studies and spirometric measurements were made. The authors believe that Thephorin is of as much value as other antihistaminic drugs in the treatment of the allergic state. 6 references. 6 tables. 3 figures. —*H. Abramson.*

DERMATOLOGY AND SYPHILOLOGY

Multiple Primary, Self-Healing Squamous Epithelioma of the Skin. *J. Ferguson Smith, Glasgow Royal Infirmary, Glasgow, Scotland.* Brit. J. Dermat. 60:315-18, October 1948.

In 1934 the author described the case of a young man who presented numerous lesions on his face, ears, arms, thighs and legs, which started as minute red macules, became papular, enlarged, ulcerated and ultimately healed, leaving deeply pitted scars, with steep sides and irregular edges. The individual lesions lasted for months and fresh lesions were appearing in numbers rather more than sufficient to balance the healing, so that the count of active lesions slowly rose. Numerous biopsies showed the lesions to have the structure of squamous carcinomata, active and malignant-looking in their early stages, and exhibiting, as they grew older, progressive cornification and ultimately, complete involution with scar-formation. A few months later Shaw Dunn and the author reported a second case, a man who presented a single large plaque, which showed in one section the whole series of changes which had been found in multiple lesions in the first case. This man later developed a second cornifying squamous carcinoma on his calf but he disappeared and could not be traced. The appearance of a third case has afforded the opportunity to bring the history of the first case up to date and to compare it with the third. The first patient lost a leg from radium necrosis of his tibia following treatment of two large lesions but the advent of Chaoul therapy made it possible to control his lesions safely and surely. He has now had this disease for at least twenty-one years and there has been no sign of metastasis. The third case is an older man aged 59 who had had the condition from the age of 29. The lesions are similar to those of case I but are smaller on the average and much fewer in number. As a colleague states that he has a similar case under observation it is suggested that there are now sufficient grounds for claiming this to be a distinctive dermatosis hitherto undescribed. It is particularly emphasized that the lesions are primary, are characteristic from the first and that the suggestion of certain commentators that case I was really pseudo-epitheliomatous hypertrophy in iododermia or bromodermia was untenable. 2 references.—*Author's abstract.*

Long-Term Results in Neurosyphilis Treated with Penicillin Alone. *John H. Stokes, Mortimer S. Falk and George D. Gammon, Philadelphia, Pa.* Am. J. Syph., Gonor. & Ven. Dis. 32:521-45, November 1948.

In this, the fourth annual report from the University of Pennsylvania on the effect of penicillin alone in neurosyphilis, observations on patients who have been followed two years or more are presented. Thirty-two of 39 patients treated in 1943 were still under observation as of March 1948. Of this group 66 per cent had achieved normal or near-normal spinal fluids; 25 per cent had showed marked improvement (improvement in all four items); and only 9 per cent were unimproved or worse. There are three graphs showing the postpenicillin trend of the spinal fluids with progression of time in asymptomatic neurosyphilis, paresis and taboparesis, and tabes

dorsalis, respectively. Few patients with asymptomatic neurosyphilis fail to achieve normal or near-normal fluids. Paresis and taboparesis do less well although the average patient does show an improvement in his spinal fluid which is apparently maintained. In tabes with type III spinal fluids the response is almost as good as in asymptomatic neurosyphilis. The following table shows the over-all good spinal fluid results in the various diagnostic categories for patients observed two years or more:

Diagnosis	Total Cases	Cases Near-Normal CSF		Cases Normal CSF		Total Normal and Near-Normal CSF	
		No.	%	No.	%	No.	%
Paresis	11	3	27	2	19	5	46
Taboparesis	20	2	10	10	50	12	60
Tabes dorsalis	55	15	27	29	53	44	80
Meningo-vascular	33	5	15	15	45	20	60
Asymptomatic	23	7	30	10	44	17	74

Several individual long-term case protocols are presented illustrating the following interesting points: (1) The excellent response of asymptomatic neurosyphilis in virtually previously untreated patients with type III spinal fluids. (2) The sometimes dramatic response of congenital neurosyphilis to penicillin after the failure of arsenicals and fever and, on the other hand, an example of the failure of juvenile paresis to respond to repeated courses of penicillin along with one course of fever therapy. (3) The persistence of a Dattner-Thomas type of spinal fluid over a period of 1,470 days despite three courses of penicillin. (4) The temporary response with subsequent relapse of the spinal fluid in a case of meningovascular which had previously failed on trivalent arsenicals, bismuth and tryparsamide. (5) The response of a case of tabes dorsalis to fourteen Swift-Ellis intraspinal treatments, plus bismuth, subsequent relapse and then favorable outcome (observed 1,359 days) following only 1.2 million units of penicillin. (6) The complete subsidence of pain in a case of tabes dorsalis, following penicillin. (7) A probable Herxheimer effect, manifested by convulsions on second day of penicillin, followed by a striking and lasting serologic and clinical response in a case of general paresis. (8) The clinical improvement without corresponding spinal fluid response following large dosage of penicillin in a case of general paresis. (9) The lasting serologic improvement and temporary clinical improvement, followed by a relapse in a case of taboparesis. (10) The illustration by means of perimetric charts of improvement in the visual fields in a case of primary optic atrophy with repeated courses of penicillin totalling 16.4 million units. (11) The striking response of paresis (with early psychotic changes) clinically with reduction of type III spinal fluid to normal.

Two life histories of neurosyphilis covering twenty-two and twenty-six years of observation of four types of therapy including routine arsenic and

heavy metal, malaria, tryparsamide and penicillin are presented. It is concluded that: "Penicillin appears to be superior to other forms of treatment for all types of neurosyphilis, and certainly entitled, on the scores of safety, convenience, and effectiveness, to first choice." 3 references. 25 figures.—*M. S. Falk.*

PSYCHIATRY AND NEUROLOGY

The Treatment of Subacute Combined Degeneration of the Spinal Cord with Vitamin B_{12}. *Tom D. Spies, Robert E. Stone, Sam Kartus and Tom Aramburu, Hillman Hospital, Birmingham, Ala.* South. M. J. 41:1030-1031, November 1948.

The beneficial effect of vitamin B_{12} on the acute neurologic manifestations of patients with pernicious anemia is illustrated by a brief presentation of 1 of 3 cases studied. The patient, a 48 year old white man, was known to have had pernicious anemia since 1944. Maintenance therapy had been inadequate; consequently his anemia relapsed a total of eight times during a period of four years. Three weeks prior to therapy with vitamin B_{12}, he had a rapid onset and progression of symptoms referable to the neuromuscular system and to the oral and lingual mucosa. His mouth and tongue were sore. Stiffness, pains, paresthesia, weakness of lower extremities and difficulty in walking were pronounced. He was mentally dull and depressed. Four 25 microgram doses of vitamin B_{12} were given intramuscularly at intervals of forty-eight hours. By the fifth day after therapy was begun, complete relief of the symptoms of glossitis and stomatitis had been obtained and there had been appreciable subsidence of the acute neurologic symptoms—the pains and tenderness were relieved, ataxia had diminished and locomotion had improved. The initial blood counts were as follows: red blood cells 3.43 million, hemoglobin 9.7 Gm. (63 per cent), PCV 37, MCV 98, MCH 34 and MCHC 35. A peak reticulocyte count of 14 per cent was obtained five days after therapy was started. During the brief period of observation, it appeared that the acute progress of the neurologic symptoms was arrested, that the symptoms were benefited by vitamin B_{12} and that the glossitis and stomatitis were completely relieved. 4 references.—*Author's abstract.*

Penicillin Therapy in General Paresis. *George D. Weickhardt, St. Elizabeths Hospital, Washington, D. C.* Am. J. Psychiat. 105:63-67, July 1948.

Penicillin is an established treatment in neurosyphilis but its value when combined with other antisyphilitic treatment in paretic neurosyphilitics remains unknown. A series of 100 legally committed patients with general paresis was treated with penicillin and observed from six months to two years afterwards. Only recently admitted patients with a definite diagnosis of uncomplicated paretic neurosyphilis were included. Cases having previously had fever therapy were excluded. Each patient received 25,000 units of sodium penicillin every three hours intramuscularly for a total of 6 million units in thirty days. A group of 60 patients received no other treatment but the remaining 40 were concurrently given a full course of 7 to 18

therapeutic quartan malaria chills. Frequent clinical and serologic examinations were made after treatment was completed. Serologically, there was no significant difference in the two groups. A rapid decrease in cell count occurred as soon as one month after the end of treatment in both groups and no difference of note developed between them in two years. The average cell count was well within normal for all cases after six months. The average protein level did not fall below 45 mg. per cent until twelve months in the combined treatment group and twenty-four months in the penicillin group. The maximum of serologic improvement as showed by the Kolmer reaction was reached in twenty-four months by both groups. The colloidal gold reaction showed a similar slow but steadily decreased intensity in both groups. Clinical results were more difficult to evaluate because of the many factors involved. Marked improvement in tremor, handwriting and dysarthria occurred in 24 penicillin and 12 combined treatment cases. Epileptiform seizures developed in 8 cases before treatment but no seizures occurred after treatment. Grand mal attacks occurred in 6 patients during or after treatment. The average body weight showed a steady gain in both groups, the maximum being reached by the penicillin group in eighteen months and by the combined group in twenty-four months. Psychiatric improvement was not evaluated except as socio-economic usefulness. There was no significant difference between the two groups. A second course of penicillin was required in six months for 6 cases because of failure to reduce protein content and cell count to normal. Of the 100 patients, 6 have died of intercurrent disease and 94 are living. Results of this study showed that there is no significant difference between treatment of paretic neurosyphilis by penicillin alone or combined with malaria therapy. 10 references. 4 tables. 4 figures.

PEDIATRICS

Streptomycin in the Treatment of Pertussis. *Harry Leichenger and Allen Schultz, University of Illinois College of Medicine, Chicago, Ill.* J. Pediat. 33:552-55, November 1948.

A review of the literature at the time this study was started failed to reveal information on the effect of this agent against pertussis in humans. It was for this reason that the pilot study was undertaken. No attempt was made to compare this form of therapy with the use of human or rabbit hyperimmune serum. Only patients having uncomplicated whooping cough in either the catarrhal or early paroxysmal stage of the disease were included in this study. The patients were assigned in rotation to one of three groups. Those in the first group received streptomycin by the aerosol route; those in the second group received it intramuscularly; and those in the third received the usual symptomatic whooping cough treatment of the Cook County Contagious Disease Hospital. The latter were considered controls. Before being assigned to a group, each patient was observed in the hospital for three days. Cough plates and blood counts were made, and the character, duration and number of paroxysms were determined. A diagnosis of

whooping cough was made only if the patient exhibited at least two of three diagnostic criteria: (1) positive cough plate; (2) a leukocytosis with a lymphocytosis; (3) typical paroxysms of coughing. The patients were all observed in one ward. Nurses were assigned to this ward continuously and were specifically charged with the responsibility of timing each paroxysm as well as recording the number for each patient. They also noted whether or not emesis occurred and all other uncommon phenomena such as convulsions, epistaxis, cyanosis and apnea. During the greater part of this study the nurses so assigned had no other duties. The usual nursing care was handled by other nurses in the ward. Upon completion of the three-day period of observation and upon having established a diagnosis of pertussis according to the above standards, therapy was started.

Group 1 patients received 1 Gm. of streptomycin dissolved in 8 cc. of normal saline solution. One cubic centimeter of this solution was administered by means of a nebulizer every three hours around the clock. Group 2 patients also received 1 Gm. (one million units) of streptomycin daily, divided into eight equal doses given intramuscularly every three hours. Other workers have recently described an efficient and inexpensive mask which is being manufactured by the Vaponefrin Company. This would simplify the administration of aerosol therapy to the young infant. While this was a small series of cases, it was thought by the investigators and nurses who observed each patient daily that the patients who received streptomycin via aerosol did much better clinically than the other two groups, despite the fact that the childen had to be awakened to receive the treatment. This awakening frequently initiated a paroxysm. No toxic effects of the drug were noted with the exception of a transitory generalized morbilliform eruption which lasted two days in 1 patient who received streptomycin intramuscularly. Since there had been no previous experience with streptomycin in whooping cough, our dosage of 1 Gm. a day and the length of treatment of one week was arbitrarily decided upon. From this pilot study, we believe there is sufficient evidence that streptomycin is of clinical benefit in the treatment of pertussis to justify more extended use. It also appears that the aerosol route of administration is the one of choice. This is in agreement with a statement recently made by another investigator. One week of treatment appears to be sufficient in the average case. No attempt to evaluate untoward reactions on the vestibular function to streptomycin was made, because treatment was only administered for one week. The decrease in the number of paroxysms, the lessening of the severity of the paroxysms, the marked decrease in complications, and especially the clinical impression obtained by trained observers, all attest to the efficacy of therapy with streptomycin, especially when given by the aerosol route. 5 references. 4 tables.—*Author's abstract.*

Management of the Pre-Allergic Child. *Bret Ratner, New York University College of Medicine, New York, N. Y.* Ann. Allergy 6:629-38, Nov.-Dec. 1948.

Intra-uterine life, infancy, illness and convalescence constitute vulnerable periods, during which every individual should be protected from undue

exposure to highly antigenic substances. Every child is potentially allergic. Much can be accomplished prophylactically by measures which aim to prevent food, dust, drug, serum and bacterial sensitivity through regulation of diet, management of environment, control of drug and serum therapy and reduction of recurrent invasions of pathogenic agents. Man battles continually against the invasion of foreign proteins. The difference between the normal individual, who battles successfully, and the allergic, who does not, is viewed by the author as dependent on quantitative rather than with qualitative mechanisms both in respect to the amount of antigen to which the individual is exposed and also the amount which actually penetrates the tissue cells. The cardinal principles for a pregnant woman to follow in order to avoid intra-uterine food sensitization of the unborn infant are: (1) a widely varied diet; (2) taking some of her food in allergenically denatured form; (3) no overeating; (4) no excessive indulgence in any single protein food or satisfaction of food cravings. A newborn infant who receives one or several bottles of raw or dry cow's milk during the first two weeks, and is then put back on the breast entirely, may develop milk sensitization which will not be evidenced until weaning is attempted. This form of sensitization may be prevented by prescribing an allergenically denatured milk for the relief formula, in conjunction with a denatured carbohydrate. During severe gastrointestinal disturbances the permeability of the intestinal wall may be increased, to permit the ready entrance of unchanged protein into the blood stream. During treatment and convalescent care of severe intestinal disturbances, such as diarrhea, dysentery, and typhoid fever, one should give allergenically denatured foods, feed a varied diet and avoid new foods and raw or lightly cooked foods. The practice of overfeeding infants and the present vogue for introducing many new foods very early in infancy is placed in this last category.

Early infancy and prolonged confinement to the sickroom are particularly vulnerable periods for development of dust sensitivity to specific dust allergens. In developing a prophylactic program every attention must be given to shield the bedroom from dust-producing elements, such as rugs, hangings, feathers and woolen materials. Infants and young children should not be permitted to sleep with pets or stuffed toys. To escape pollinosis, which results usually from undue exposure to pollens, the seashore or other sections of the country that are relatively free from pollen may be more advisable for vacation purposes. Insecticides which contain pyrethrum are potentially allergenic. Pyrethrum is closely related biologically to ragweed pollen. Drugs in themselves are not antigenic but may form antigenic conjugates in combination with proteins of the animal body. The phenolphthalein group of cathartics, the pyramidon and allonal drugs, external medicaments, have all resulted in specific sensitivity. The indiscriminate use of the sulfonamide combinations and antibiotics should be curtailed. Caution should be observed in giving drugs to pregnant women and nursing mothers. Knowledge concerning the pathogenesis of bacterial allergy is comparatively scant. It is difficult to say how it may be successfully diagnosed and differentiated from the disease with which it is associated. An allergic mechanism may lie behind the repeated common cold or coryza. It is more

than likely that human beings are sensitive to one or more of the organisms in their respiratory tracts and that the degree of this sensitiveness fluctuates according to the recently existing local flora. All infectious processes in early infancy and childhood should therefore be meticulously treated, for the prevention of recurrent episodes should materially reduce the severity of the infections. Proper hygienic and dietary measures and judicious use of vaccines all help to prevent bacterial allergy. Pertussis, pneumonia, measles and scarlet fever often antedate asthma. Whether any direct relationship exists between these diseases and the subsequent allergy is difficult to determine. Serum hypersensitivity should also be guarded against. Serum sensitivity can best be prevented by diminishing excessive contact with horses and rabbits, by desensitization of patients sensitive to animal dander, and by avoiding the indiscriminate use of antiserums in meningitis and suspected diphtheria or tetanus. 12 references.

Cup Feeding of Newborn Infants. *Robert C. Fredeen, University of Kansas School of Medicine, Kansas City, Mo.* Pediatrics 2:544-48, November 1948.

For 10 years the author has been practicing the feeding of infants from a cup or glass, starting in the newborn period. This method of feeding is stated to assure the artificially fed infant the same pleasurable physical contact with the mother as is enjoyed by the breast fed infant, since during feedings the infant is cradled in his mother's left arm similar to the manner used by the mother who feeds her child from the breast. The procedure varies depending upon the infant but usually the whole feeding is given in five to ten minutes. The method has been employed with fullterm infants, premature and immature infants, infants with harelip and cleft palate and older infants both healthy and sick. Those with a harelip or cleft palate are said to take their food rapidly and without apparent difficulty. With practice spillage usually becomes negligible after the first few feedings. Regurgitation, vomiting and colic are minimal. The impression has been gained that cup feeding instituted at birth did not lead to psychologic difficulties either in infancy or later childhood. 2 references. 1 figure. 2 tables.

(The wisdom of early cup feeding as here recommended must be seriously questioned, although the author's observations suggest that the psychologic needs of the infant for the motions of sucking are perhaps being currently overemphasized in some instances. Before sponsoring a widespread changeover from customary habits of breast and bottle feeding one would like to see the advocates of this method bring forward objective proof that cup fed infants are free from mental difficulties and remain so throughout later life, in view of the growing body of evidence from the psychiatric field that sucking while nursing satisfies certain deepseated needs of the personality. There ought also to be controlled statistical studies on the comparative incidence of aspiration pneumonia in large groups of infants fed with the cup as compared to bottle and breast. For the present the conservative man will look on the proposal as being in the stunt category.—I. J. WOLMAN.)

OBSTETRICS

Avoidable and Unavoidable Obstetric Hemorrhage. *Hugh G. Hamilton, Kansas City, Mo.* J. Missouri M. A. 45:647-54, September 1948.

In spite of the reduction in maternal mortality obstetric hemorrhage still comprises approximately 30 per cent of all maternal deaths. The hemorrhagic conditions of pregnancy are divided into hemorrhagic accidents of early and late pregnancy as well as into the classification of being avoidable and unavoidable. The most common cause of hemorrhage in early pregnancy is abortion and it is stressed that there is a definite relationship between sepsis and blood loss, so that to conserve the mother's welfare at all times the control of blood loss should be one of the major considerations of treatment. It is showed that practically no woman ever dies of hemorrhagic disorders associated with abortions without there having been adequate time to institute replacement therapy with blood. Ectopic pregnancy is also frequently fatal and often is as frequently fatal from inadequate preoperative blood transfusion as it is from inadequate postoperative blood transfusion. The possibility of recurrence of ectopic pregnancy in the other tube is pointed out as well as the possibility of the occasional bilateral ectopic pregnancy. In consideration of the bleeding states associated with hydatidiform mole and chorion epithelioma the necessity of the careful replacement of blood loss as well as the follow-up care of observation for recurrence as evidenced by positive Friedman tests is stressed. It must always be born in mind that bleeding early or late in pregnancy can also be associated with the blood dyscrasias, i. e., thrombocytopenic purpura. In the consideration of abruptio placenta the blood loss may be concealed or external and it is pointed out that the classic sign of boardlike rigidity of the uterus is present in not more than 60 per cent of the cases and this occurs usually if the majority of the hemorrhage is concealed. The free use of transfusion is necessary in this condition as well as in the handling of cases of uterine laceration in delivery or spontaneous rupture.

Placenta previa is one of the greatest causes of antepartum and intrapartum hemorrhage. It is a sound rule that whenever a patient is suspected of placenta previa that she be hospitalized at once and considered as a case of placenta previa until proved otherwise. The death rate from placenta previa is far too high and in most cases the death results from the failure of proper diagnosis and proper use of whole blood in the treatment of shock or impending shock. If the placenta previa is total a cesarean section is required. If the placenta previa is marginal or partial the majority of them can be delivered vaginally unless there are other contraindications to vaginal delivery. The care of placenta previa begins early in the pregnancy before the woman has been demonstrated to have a placenta previa, by the proper maintenance of the woman's blood count during the course of her prenatal care and it is also important that patients be instructed to report to their physician immediately any occurrence of bleeding. The importance of the proper management of the third stage of labor is discussed as well as the varying technics for reducing the blood loss in the third stage. It is further

stressed that when one is treating a woman by replacement therapy of whole blood for blood loss that one should be careful to try to overestimate rather than underestimate the amount of blood needed. 57 references.—*Author's abstract.*

Cord Complications During Pregnancy and Labour. *Joyce Morgan, Hillingdon County Hospital, Uxbridge, England.* Brit. M. J. 4583:820-22, Nov. 6, 1948.

Fifty cases of prolapsed cord occurred in a series of 10,000 deliveries, i. e., an incidence of 0.5 per cent. There were no maternal deaths but the combined fetal and neonatal death rate was 40.5 per cent. Eight cases admitted with a dead fetus received no special treatment. Eleven cases when the cord prolapsed on three-quarters or full dilatation were treated with forceps delivery, with 1 stillbirth. Six cases when the cord prolapsed at full dilatation were left to deliver normally with 1 stillbirth and 2 neonatal deaths. Eight cases when the cord prolapsed at three-quarters or full dilatation were treated by internal podalic version and manual delivery with 3 stillbirths and 2 neonatal deaths. Of the 15 cases when the cord prolapsed with the cervix less than half dilated, 4 were treated with manual dilatation and forceps delivery with 1 neonatal death, and 1 was left until full dilatation and then delivered of a stillborn fetus. Two had internal podalic version with 2 stillbirths. The remaining 8 were treated by cesarean section, with 2 stillbirths. Other cord complications are also described, including 3 cases where diagnosis of cord twisted round the neck or body of the fetus was made during antenatal version. Two of these cases were treated by cesarean section with live infants, while the third had a stillborn infant after a normal delivery. Cord round the neck, preventing descent of the head and causing fetal distress occurred in 5 cases. One was treated with cesarean section with a live infant, 3 with forceps with live infants and 1 normal delivery of a stillborn infant. 3 references. 2 tables.—*Author's abstract.*

Prenatal Diphtheria Immunization. *Michael A. Brescia and Edward F. Tartaglione, St. John's Long Island City Hospital, Queens, N. Y.* Arch. Pediat. 65:633-39, December 1948.

Prenatal immunization as a routine obstetric procedure opens up a new and important advance in preventative medicine. There is no doubt that the immunologic status of the newborn mirrors that of the mother. Two hundred and seventy-three pregnant women were Schick tested and 40 per cent were Schick positive. Nineteen pregnant women were immunized with alum-precipitated diphtheria toxoid. These were all converted to Schick negative and their newborns were also Schick negative. Six pregnant women with a definite history of diphtheria immunization during childhood received a single injection of the toxoid as a booster. These were all converted to Schick negative and all their newborns were also Schick negative. It can be assumed at this time that a majority of the prospective mothers have been immunized sometime during their childhood. Hence, even one injection of diphtheria toxoid as a so-called booster is sufficient to recall enough antibodies to convert a Schick positive (nonimmune) mother to a negative

Schick together with a negative Schick (immune) infant. The prospective mother who has never been immunized is in need of the complete series. We have recommended: (1) that all pregnant women be Schick tested as part of their prenatal care; (2) if the Schick test is positive, the prospective mother should be actively immunized against diphtheria. If this procedure is refused, then her newborn should be immunized at 1 month of age; (3) if the Schick testing is burdensome, then the most good can be obtained by routinely administering a booster dose of diphtheria toxoid to all pregnant women; (4) infants born of immune (Schick negative) mothers should be immunized at 6 months of age. 16 references. 3 tables.—*Author's abstract.*

GYNECOLOGY

The Conservative Treatment of Placenta Previa. *W. G. Mills.* Brit. M. J. 4585:896-99, Nov. 20, 1948.

Conservative or expectant treatment of placenta previa is based upon the contention that the first hemorrhage will never be fatal in the absence of vaginal manipulation and that subsequent hemorrhages will not be fatal if the hemoglobin level was normal when bleeding began. Results are reported in a series of 100 cases of placenta previa largely treated conservatively. The principles of treatment were that, if possible, no infant should be delivered before about the thirty-seventh week of pregnancy. Risks of asphyxia to the fetus and unnecessary blood loss to the mother were considered to outweigh the possible advantages to the fetus of the last few weeks in the uterus. A severe hemorrhage before the last three or four weeks was therefore treated conservatively but during these weeks was considered an indication to empty the uterus. The usual procedure with hemorrhage before the thirty-seventh week was to examine the cervix with a speculum upon admission, give morphine as indicated, check the hemoglobin level, make blood tests and wait for the bleeding to stop. No attempt at radiographic location of the placental site was made and no vaginal examination made unless immediately before a cesarean section. Primiparas were often sent home to bed after several days without further blood loss and most cases with only slight loss before the thirty-second week were allowed up and about with instructions to go to bed immediately if further hemorrhage occurred. Section was usually done when the placenta was palpated across the cervix or coming up to its margin. Experience has indicated that active treatment may be deferred in over 50 per cent of cases unless there has been procrastination on examination before admission, when this is reduced to 25 per cent. The disadvantages considerably outweigh the advantages of conservative treatment for the mother as she must either stay in hospital or be severely restricted at home for a number of weeks and may have further hemorrhage. There is slightly less likelihood of cesarean section however, little increased danger to life, and much more probability of having a live infant. Section was done in 47 of the 103 cases in this series. Advantages of the conservative treatment greatly exceed the disadvantages for the fetus as prematurity is the chief cause of fetal death in these cases. Delay of even a

few hours is unjustifiable after the fetus has reached a satisfactory stage of development as any serious bleeding may cause sudden fetal asphyxia. Published reports after conservative treatment show a fetal and neonatal mortality below 30 per cent for the first time. There were no maternal deaths in this series and a fetal mortality of 16.5 per cent. Expectant measures are only possible in areas having reasonably good transportation but in those, with cooperation from local doctors, the fetal mortality could well be reduced to about 10 per cent and the maternal mortality remain nominal. 11 references. 2 tables.

The Proper Management of Functional Menstrual Disorders. *A. E. Rakoff, Jefferson Medical College and Hospital, Philadelphia, Pa.* M. Clin. North America 32:1509-22, November 1948.

It is necessary to study thoroughly the patient and evaluate etiologic factors before prescribing treatment for a case of functional menstrual disorder. Malignancies and other serious lesions must be excluded in diagnosing functional uterine bleeding. A menstrual disorder may be an early sign of various diseases such as tuberculosis, leukemia, anorexia nervosa, etc. True endocrine diseases of the pituitary gland and ovary cause menstrual dysfunction much more rarely than the common secondary pituitary-ovarian disorders. General hygienic measures are always necessary. Uterine curettage is useful diagnostically and may also be valuable therapeutically, especially in terminating cases of excessive bleeding. Psychotherapy is being more constantly used because many menstrual dysfunctions result from emotional disturbances. Thyroid extract has been the most generally used endocrine treatment and has frequently given good results in functional menstrual disorders and infertility even though used empirically. The indiscriminate or routine use of thyroid may produce harmful results and should be discouraged, it only being used in cases having clinical and laboratory evidence indicating thyroid deficiencies. Vitamins have been disappointing but large doses of the natural tocopherols, 100 to 150 mg. daily, have been of limited value in controlling mild vasomotor symptoms. Oxytocics are helpful in excessive postpartum bleeding caused by subinvolution of the uterus but are of doubtful usefulness in other varieties of functional bleeding without myometrial disturbances. Gonadotropic and gonadal hormones are the most specific treatment for functional menstrual disorders but should not be used indiscriminately without adequate diagnosis. Properly used hormonal therapy is often the best. Follicle stimulating gonadotropic substances are used when there is irregular or deficient production of pituitary gonadotropins with amenorrhea, sterility or excessive uterine bleeding, best results being obtained in the last and poorest in the first of these. This treatment should be avoided in patients approaching the menopause and young women with cystic or other ovarian enlargements. Chorionic gonadotropin is only occasionally helpful and then sometimes in conditions resulting from inadequate corpus luteum function. Prolactin is sometimes useful in menorrhagia and may be given alone or with chorionic gonadotropin.

Estrogens are indicated in cases of primary ovarian dysfunction but are

of little use in premenstrual tension, menstrual migraine and cystic mastitis. Better results are obtained in patients approaching the menopause than in young women. It is believed that large doses of estrogens should not be used routinely for functional bleeding, increased hemorrhage frequently following an initial decrease. They are specifically indicated in the treatment of menopausal patients with severe symptoms. Estrogens should not be used until after a careful pelvic examination has found normal pelvic organs. They should only be given menopausal patients having a clear history of either amenorrhea or cyclic bleeding as irregular bleeding commencing during estrogen therapy may really be caused by a malignancy. Estrogens are sometimes helpful in essential dysmenorrhea if given in sufficient dosage to inhibit ovulation. They should only be used two or three months for temporary relief of pain, as an aid in establishing a diagnosis of primary dysmenorrhea, and perhaps to cause some uterine growth.

Progesterone has been increasingly valuable in treating functional menstrual disturbances. It regulates the pituitary-ovarian cycle and is less likely to cause ill effects than other hormonal preparations. It is most useful given in large doses for the treatment of amenorrhea and seems to work equally well with patients having primary ovarian or primary pituitary deficiencies. Injections of 20 mg. on three consecutive days in amenorrhea of recent origin usually causes withdrawal bleeding four days later. This treatment may be given for three periods and then stopped to see if spontaneous cycling will follow. Long standing cases of amenorrhea should be given estrogens for several weeks before progesterone or they may be given together in large doses over two to five successive days. Progesterone is of little use in stopping functional bleeding but 5 mg. injections twice a week or 10 mg. daily oral doses of anhydrohydroxy progesterone during the last ten days of the menstrual cycle may prevent menorrhagia during the following cycle. Anhydrohydroxy progesterone in 20 mg. daily doses for the ten days preceding menstruation is often helpful in dysmenorrhea. Progesterone should not be used in premenstrual tension as it may cause an increase of symptoms. Androgens have become important in the treatment of menstrual disorders, testosterone being chiefly used in the control of excessive functional uterine bleeding. Testosterone propionate is given hypodermically and methyl testosterone orally. It is also given for ten days to two weeks before menstruation to prevent recurrent menorrhagia. Testosterone is probably the most useful hormone for control of severe premenstrual tension, being given cyclically in 5 to 10 mg. doses by mouth daily from the fourteenth to the twenty-fourth day. It may be similarly used in cyclic mastitis or premenstrual mastalgia. Testosterone is also useful in selected menopausal patients when estrogens are contraindicated. Irradiation therapy should be carefully used in young women but is widely and satisfactorily used in controlling functional menopausal bleeding. Surgery for other than diagnosis requires careful consideration in these conditions. Presacral neurectomy to cure dysmenorrhea is difficult technically but experienced operators obtain a high percentage of good results. 4 references.

Cytology. New Key to Cancer Diagnosis and Research. *J. Ernest Ayre, Royal Victoria Hospital, McGill University, Montreal, Que., Canada.* McGill M. J. 17:311-24, October 1948.

The study of epithelial cells in surface scrapings from accessible tissues provides a new technic applicable to cancer diagnosis and research procedures. This method has been described as a surface biopsy and is mid-way between the usual smear technic which utilizes exfoliated cells and a surgical biopsy. Using a specially adapted spatula, cells may be scraped from the squamocolumnar junction of the uterine cervix. Meticulous study of these cells may reveal to the experienced cytologist evidence of early malignant activity before the gross appearance of the cervix would arouse any suspicion in the mind of the most astute clinician. A glass slide has been used as a spatula by W. B. Ayre, for obtaining surface biopsy material from the tongue and buccal mucosa. By investigations with this method changes in the cornification of the surface cells of the oral mucosa with the administration of estrogens have been followed and a buccal smear picture, characterized by low cornification has been found in heavy smokers. In 1941 Papanicolaou published his findings of cancer cells in the vaginal secretions. In 1942 comparative studies of cells collected from the external os of the cervix as compared to vaginal smears lead to a report of our first modification of the Papanicolaou technic. This was a cervical smear from the external os of the cervix and in cancer cases a greater concentration of neoplastic cells was consistently found in the smear taken from the external os of the cervix. As the applications of the principles laid down by Papanicolaou soon brought to notice repeated examples of normal appearing cervices from which cancer cells were aspirated, a wooden scraper was evolved to enable the sampling of cells from the squamocolumnar region, the circumference in which cancer was known to develop. This cervical scraping technic has broadened considerably our knowledge of the early stage of cancer. The results of this selective method have revealed clear cut evidence that the early stage of cancer of the cervix is a preclinical disease which cannot be recognized by the naked eye and which in many cases is totally asymptomatic. At the time of writing, over 21,000 cytology tests have been studied on 7,000 patients in the Gynecytology Laboratory. In routine practice, a cervical os aspiration, then a surface-biopsy scraping is taken on every patient. The dual test ensures greater accuracy if technic is faulty in either one or the other. To date, we have studied 580 cases of malignancy. The average percentage of error has been 3.2 per cent. (Most of the "misses" were frontal carcinoma.)

It is perhaps of greater significance, however, that only 15 cases of actual cancer have subsequently been found present by biopsy, which were not reported as present in cytologic studies. In comparison to the over-all error of 3.2 per cent, results using the combined surface-biopsy scraping and the cervical os smear indicates greater accuracy. In our last 1,250, the percentage of error has been reduced to 1.46 per cent. This figure includes the group of lesions defined as carcinoma-in-situ. The total series is made up of several different groups and the total results are not indicative of an expected incidence of this type of cancer in the general population. Obviously, the in-hospital group of cases included known and suspected cases of cancer prior

to their admission. A significant group in relation to widespread screening for cancer is the report of results in cytology tests mailed to our center using the glycerine mailing method. Amongst the first 989 cases mailed to us from doctors as far away as Florida, California and Vancouver, 58 cases of cancer have been diagnosed. Five per cent of those who have reported pathologic results have been found to be in error. (It is only possible to estimate the over-all error using the mailing technic but the results to date lead us to believe that accuracy may be estimated at better than 90 per cent.) The surface-biopsy method has proved itself so sensitive as to present us with a transitional group of cells which appear not to be normal nor to be cancer. They have, therefore, been arbitrarily designated as the precancer cell-complex. This unusual aggregation of cells from the squamous margin constitute cells exhibiting the following features: (1) abnormally high cornification in squamous margin; (2) multi-lobulation of basal cells and cells from the middle zone; (3) multi-nucleation in cells of deep layer and also superficial cornified type; (4) perinuclear halo; (5) hyperplastic irregular nucleus exhibiting hyperchromatism. The recognition of this interesting and provocative group of cells calls for further research to permit an adequate evaluation of their reversibility and their growth potentialities. 5 references. 2 figures.—*Author's abstract.*

SURGERY

Surgical Uses of Polythene. An Experimental Study. *John H. Grindlay and Frank C. Mann, Mayo Foundation, Rochester, Minn.* Arch. Surg. 56:794-812, June 1948.

Polythene (polyethylene) is one of the more recently developed plastics and is made by polymerizing ethylene by heat and pressure. It somewhat resembles paraffin in appearance, is not wetted by water, is light weight, a poor heat conductor, an excellent electric insulator and nonradiopaque. It differs from paraffin in being rather flexible, has marked tensile strength, may be sterilized by boiling, is insoluble and unaffected by acids, alkalies, solvents and powerful reagents. It may be surgically sterilized either by boiling in water for twenty minutes or by washing in alcohol-ether mixture and then being immersed for a half-hour in 1 to 1,000 aqueous solution of zephiran chloride. Experiments showed that plastic tubes were better cannulas than any other tubes. Studies were then made to determine which plastics were best and what use they might have in clinical surgery as permanent implantation for reconstruction of various nonbony structures and organs. Tantalum, vitallium and lucite are satisfactory as far as they go but they are only of limited use because of their rigidity, hardness or brittleness. Polythene was used as commercially extruded tubing, film or tubes made by the author's technic of fusing layers of film into tubes. When the extruded tubing was used as cannulas in lymph vessels, it was found that no clotting of lymph occurred within the tube. When used in making fistulas of the common bile duct and the pancreatic duct, no solid material adhered to the wall and there were no significant changes, dilatation or

infection of these ducts above the drainage point. When used for drainage of the lateral ventricles of the brains of 3 dogs, there were no signs of coating with organic material two and six months later, nor any signs of abnormal behavior, motor or sensory disturbance after a year. Polythene tubing 0.6 mm. in diameter was found to be better than the usual intravenous needle for continuous intravenous therapy because it could be introduced into a vein through a 17 gage intravenous needle, passed some distance up the vein and the needle withdrawn. This was used in dogs for several hours each day for two weeks, the tube being closed with a short stylet and left in place between infusions. When the vein and tube were removed and examined afterwards, the vein was found much thickened near the point of entrance of the tube but only slightly so near the tip of the tube.

Thin sheets of polythene, 0.05 mm. thick, were placed subcutaneously between muscle layers and intraperitoneally in dogs without any undesirable reaction. The film was found to be surrounded with a thin white layer of hyaline tissue containing few cells or vessels when removed four weeks later. When used under a long laparotomy incision, it was found after four weeks to have prevented adhesions to the wound and to have caused no reaction, there being no indication of omental thickening or increased vascularity and the peritoneum smooth and shiny. When used to replace surgically excised dura mater, no signs of cicatrical formation were found between the membrane which formed under the film and the pia or cortex after four and six months. When used in clinical surgery, it was found better than petroleum dressings in granulating wounds or ulcers, there being better drainage and no foreign body reaction. Penrose drains and tissue drains of strip polythene were found superior to rubber drains. It was found better and easier to use than other materials when placed against the raw surface of a perineal resection wound and made the second stage of the operation easier when placed between subscapular tissues and the beds of resected ribs after the first stage of thoracoplasty. Specially shaped molded tubes were then made by tightly wrapping layers of film less than 0.13 mm. thick about polished brass tubes. The several layers of film fuse when the rolled film is tightly held and sufficiently heated. The mass shrinks tightly to the brass tube but does not shrink longitudinally. The brass tubing is coated with a soap film and then 2 thicknesses of ordinary cellophane before the film is applied. The soap acts as a lubricant and enables the polythene tube to be easily removed after it has cooled. The cellophane is readily removed. Tabs, bands and flanges may be easily added. Tantalum wires were placed between the layers of film to permit localization of the tube's position by roentgenogram. A single wire 0.13 mm. thick can be clearly seen on a roentgenogram even with the tube in the common duct. Two sizes of these tubes with internal diameters of 5 and 3 mm., wall thicknesses of 0.25 and 1.00 mm., and both 8 cm. long, were used for anastomosis of the common duct in dogs. Some tubes remained in place over a year. There were then no signs of common duct obstruction or of the tubes becoming occluded. Two piece molded polythene tubes were also used for anastomosis of the lower part of the colon after resection in dogs. They were passed during defecation in about a week but neither

leakage nor stricture of the bowel occurred. In discussion, F. C. Mann of Rochester, Minn. stated that in their experimental work, they had found polythene to be the most promising foreign material recommended for reconstruction of living tissue because its surface does not wet and it causes little tissue reaction. It was found of great value experimentally and its clinical adaptability will depend upon the surgeons. 4 references. 3 tables.

Intra-Arterial Transfusion. Experimental and Clinical Considerations. *Roy L. Robertson, Irving H. Trincher and Edward W. Dennis, Emory University School of Medicine, Grady Memorial Hospital and Emory University Hospital. Atlanta, Ga.* Surg., Gynec. & Obst. 87:695-704, December 1948.

The clinical application in 12 patients of a method for rapid administration of blood intra-arterially is presented. The blood, contained in a 1,000 cc. Kelly bottle, flows through a glass Y to the cannulated artery and an aneroid manometer unit. The pressure within the entire system may be maintained at any desired level by means of controlled air pressure from a sphygmomanometer bulb applied above the blood in the reservoir. An interface between the sterile and unsterile parts of the apparatus is provided by the aneroid manometer unit. Before using (with exception of the rubber bulb and aneroid gage, the apparatus may be autoclaved) the system is assembled, fastened in place with double-end clamps and filled with citrate solution. Transference of the blood from the collecting bottles is made by filtering through layers of sterile gauze. The radial, dorsalis pedis and posterior tibial arteries are most often used, the vessel being exposed, its wall incised (small longitudinal incision) and the cannula (any type metal or glass cannula of 14 or 15 gage) introduced and directed proximally. A distal ligature prevents back bleeding. An estimate of the pressure required for transfusion depends on the patient's condition, his former pressure and the pressure within the cannulated artery. This latter reading is obtained from the aneroid gage by releasing the clamp behind the cannula. The transfusion should be initiated at a pressure of 50 mm. in patients whose blood pressure is imperceptible. With a rise in the patient's arterial pressure, both velocity and volume of flow through the cannula diminish and approach zero as the pressures equalize. The arterial pressure can be controlled within narrow limits by maintaining a constant head of pressure in the transfusion reservoir. This method is indicated primarily in treating shock from a rapid decrease in blood volume; severe traumatic shock which defies conventional therapy; intra-abdominal and intrathoracic hemorrhage; exsanguination in obstetric emergencies; anesthetic emergencies; and asphyxia. Other measures for combating shock and hemorrhage should be employed simultaneously. Since intra-arterial transfusion involves the sacrifice of an artery, it should be reserved for extreme emergencies in which conventional therapy has failed. It has little place in treatment during the terminal stages of acute or chronic disease in which only a transitory response could be obtained. Intra-arterial transfusion is not contraindicated in cases of active bleeding from a wound, peptic ulcer or traumatized organ if there is a possibility of control of the hemorrhage. Reports of the 13 cases of intra-arterial transfusions are presented. 10 references. 2 tables. 6 figures.

The Intravenous Administration of Fats as a Means of Parenteral Alimentation. *Manly Y. Brunt, Bowman Gray School of Medicine, Wake Forest College, Winston-Salem, N. C.* J. Bowman Gray School Med. 6:181-84, December 1948.

The preparation of a stable fat emulsion which can be safely administered intravenously has presented difficult technical problems. The use of a variety of emulsifying agents, including egg lecithin, polyglycerol esters, gelatin and soybean phosphatides, has made possible the preparation of an emulsion sufficiently stable to resist heat sterilization. When this emulsion is homogenized at 4,000 pounds pressure, only an occasional fat particle exceeds 2 microns in diameter and the hazard of fat embolism is eliminated. Fat emulsions administered intravenously are utilized in fulfilling the body's caloric demand, as is indicated by a depression of the respiratory quotient and the prevention of weight loss. Infused fat is not lost in the urine or feces, nor deposited as such in the tissues to any extent except in the reticulo-endothelial system. From the meager clinical experience recorded to date it is not possible to form an unequivocal judgment concerning the value of fat infusions. No untoward reactions have been noted clinically and necropsy has revealed no damage resulting from intravenous fat infusions. Because fats have a high caloric value and because a 3 per cent emulsion of fat does not behave as a hypertonic solution, a tremendous number of calories can be given in a small volume. This has important therapeutic implications. In addition, fat infusions may serve to carry fat soluble vitamins, to lower the specific dynamic action of protein, and to supply essential fatty acids.—*Author's abstract.*

The Diagnosis and Management of the Postcholecystectomy Syndrome. *J. Russell Twiss and R. Franklin Carter, New York Post-Graduate Hospital, New York, N. Y.* New York State J. Med. 48:2245-51, Oct. 15, 1948.

Of 295 patients having had cholecystectomy, 121 calculus cases having no symptoms were investigated to determine whether the precholecystectomy investigation or the postcholecystectomy follow-up visits differed in any significant way over those patients having symptoms following cholecystectomy. One hundred and fifty-nine calculus patients having had postcholecystectomy symptoms were reviewed to determined the cause of the recurrent symptoms. The conclusions based on the study were that the postoperative symptoms were due in order of frequency to dyskinesia, injury of the common duct, cholangitis, retained common duct stone, retained remnant of cystic duct, benign fibrous stenosis of the common duct, pancreatitis, carcinoma of the ampulla of Vater and duodenal diverticulum. A complete diagnostic investigation both before cholecystectomy is performed and at the time of recurrent symptoms, was urged. Cholecystectomy should be performed only in the presence of definite evidence of organic disease, as indicated by the history, physical examination, roentgen ray of the gallbladder, duodenal drainage or blood chemistry. The postoperative work-up in those patients having symptoms, should include all of the original diagnostic investigations with the possible exception of roentgen ray. The value of duodenal drainage as a diagnostic measure is stressed, particularly from the viewpoint of diagnosing common duct obstruction, active infection of the biliary tract or the presence

of malignancy. In those patients coming to re-operation, the operative findings and procedure are reviewed. In those patients having organic obstruction of the common duct, short-circuited operations were performed. In some cases of this type repeated operations were necessary either because of a closure of the operative stoma or because of the formation of recurrent stones. 32 references. 5 tables.—*Author's abstract.*

Chronic Fissure of the Lower Lip. *Reed O. Dingman, University Hospital, Ann Arbor, Mich.* Plast. & Reconstruct. Surg. 3:613-16, September 1948.

Simple excision of chronic fissure of the lower lip has frequently proved inadequate because of the residual scar in the line of incision. The fissure therefore tends to recur. A combination of excision and Z plastic procedure on the mucous membrane surface of the lip is described which minimizes the midline scar contracture. The incisions are showed in fig. 2. The scar and fissure are excised to the depth of normal submucous tissue and a Z incision also outlined to give increased length in the sagittal plane. This provides additional fullness of the lip so that there is sufficient bulk of tissue in the midline to offset the scar and minimize contracture in the sagittal plane. A good full lip is provided with slight chance of recurrence of the fissure. This operation has been used in a number of cases to date without recurrences. 1 reference. 5 figures.—*Author's abstract.*

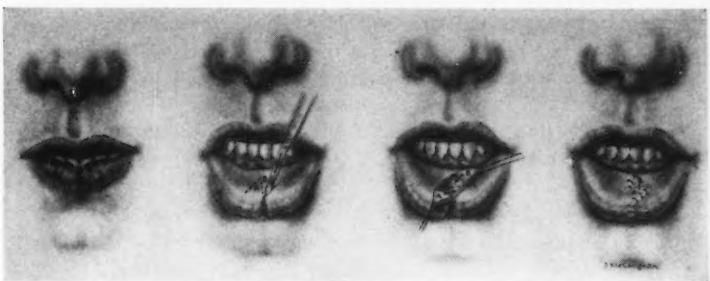


Fig. 2. "In order to get a permanent, satisfactory, surgical result, excision of the fissure and lengthening of the lip in the midline is necessary. The Z plastic is made on the mucosal surface of the lower lip."

By courtesy of Journal of Plastic and Reconstructive Surgery.

The Dilute Pentothal Drip Infusion. *Barnett A. Greene and John W. Pillon, Adelphi, Brooklyn Women's and Unity Hospitals, Brooklyn, N. Y.* Surgery 24:855-59, November 1948.

As a result of its varied and great usefulness in over 5,000 cases the administration of pentothal sodium in very dilute solution as a drip infusion is the subject of this report. The pentothal sodium powder is added to any of the solutions used for the intravenous administration of water, sodium chloride or glucose. The concentration is ordinarily 1:1,000 but it should be varied from 1:250 to 1:2,000 depending on the effect desired and anesthetic resistance of the patient. The most frequent application has been the 1:1,000 solution for sedation or light hypnosis and for anti-emesis during spinal anesthesia, especially in upper abdominal surgery. As a basal anesthetic the dilute drip is a most precise method of producing a minimal but sustained level of general anesthesia starting in the patient's room for later supplementation in the operating room. Because of its antithyrotoxic qualities pentothal sodium is especially valuable in surgery for hyperthyroidism; for these cases the dilute pentothal infusion is specifically appropriate to maintain basal anesthesia and fluids during operation and to control thyroid toxicity postoperatively. As a controllable depressant of excessive activity of the sympathetic nervous system, pentothal sodium is valuable in antagonizing epinephrine and ephedrine reactions during regional anesthesia or hyperactive sympathetic reflexes during the induction of general anesthesia in patients emotionally disturbed or made so by cocaine, fear or pain. The dilute pentothal drip is a most convenient method for the induction of general anesthesia in cardiac patients not only because of the above mentioned qualities but also because it is without effect on the heart and the peripheral circulatory system. Intravenous procaine hydrochloride, used to protect against excessive cardiac irritability, may be added to the dilute pentothal infusion. Thus procaine 1:1,000 and pentothal sodium 1:1,000 may be administered more conveniently and safely at the same time. Curare solution may be injected directly into the tubing of a dilute pentothal infusion with negligible precipitation and without decreased curare effect. As a means of utilizing the anticonvulsant or the hypnotic qualities of pentothal sodium for hours in special cases outside of the operating room the dilute pentothal drip is the only safe and practicable method. Dilute pentothal is not a substitute for poor regional or spinal anesthesia; and it is not to be allowed to disguise symptoms of anoxia. It requires the safeguards always required for the best use of intravenous anesthesia. 15 references.—*Author's abstract.*

UROLOGY

The Treatment of Urinary and Genital Tuberculosis with Streptomycin. *Frederick Lloyd, George Baumrucker and Oliver Stonington, Veterans Administration Hospital, Hines, Ill.* S. Clin. North America 28:1639-42, December 1948.

Streptomycin is of very limited value when employed by itself in the treatment of urinary tuberculosis and genital tuberculosis in the male. The symptomatic improvement which so often accompanies its use in involvement of the urinary tract is due to the temporary healing of bladder lesions and is apt to be very misleading to the unwary. Renal tuberculosis with positive pyelographic findings does not respond well to streptomycin; in fact, the destruction of the kidney may occasionally be accelerated by its use. In very early renal lesions with a low leukocyte count in the urine obtained by ureteral catheter and with normal pyelographic findings the response to streptomycin seems to be excellent. Only a prolonged follow-up study (five to ten years) will make it possible to tell if such cases actually heal or only become quiescent, to flare up again later. Streptomycin has little effect upon lesions in the male genitalia but it does cause prompt healing of scrotal fistulas. When used in conjunction with surgery it will undoubtedly prove of tremendous value. The partial healing effect which is not adequate by itself will probably enhance the results of operative treatment. The percentage of cures following nephrectomy for unilateral renal tuberculosis should be increased appreciably. Only further studies with long periods of observation will give the final answer to this problem. The healing of tuberculous lesions in the bladder, which respond slowly after nephrectomy, is accelerated by streptomycin therapy. When the bladder responds poorly because the ureteral stump fails to heal following nephrectomy, the use of streptomycin should render secondary ureterectomy a far safer procedure. Loin fistulas and postoperative tuberculous wound disruption, which have been such an annoying problem in the past, heal promptly on streptomycin therapy.—*Author's abstract.*

Urethral Caruncle. *James K. Palmer, John L. Emmett and John R. McDonald, Mayo Foundation and Mayo Clinic, Rochester, Minn.* Surg., Gynec. & Obst. 87:611-20, November 1948.

The embryology and anatomy, histology and etiology of urethral caruncle are reviewed. The symptoms of this lesion are out of all proportion to its size. Although some caruncles are painless, severe pain, variously described, is one of the most common symptoms. Bleeding, usually scanty, is another common symptom. Pruritus, nocturia, frequency and division of the urinary stream are among the other complaints. The lesion, restricted to the female urethra, has been described as a raspberry-like growth or "a small red, pedunculated or sessile, vascular tumor" which is usually single but may be multiple. Microscopic examination is essential for diagnosis and a caruncle must be differentiated from urethral polyp, urethral papilloma, urethral prolapse, periurethral abscess, urethrocele and urethral varicosity, carcinoma, condyloma or diverticulum. Some caruncles will respond to either conservative or radical

treatment. The methods of treatment reported in the literature are summarized. Conservative treatment consists of the topical application of caustics and roentgen ray and radium therapy; radical treatment of simple fulguration, simple excision, destruction with an electric needle or removal with an electrosurgical knife or electric cutting loop and urethroplasty; and combined treatment of simple excision and cauterization, and excision and roentgen ray or radium therapy. A histopathologic and clinical study was made of 120 cases seen at the Mayo Clinic. Although 17 cases were asymptomatic, the microscopic picture was no different than that of the other cases. From this study urethral caruncles appear to be caused by several factors. First the anatomic structure encourages both regional and circumscribed prolapse and the anatomic location makes exposure to trauma and irritation almost constant. Second, the histologic structure of the urethral meatus encourages marked inflammation, congestion and increased sensitivity. While age and marital history are considered contributing factors, they are not regarded as being basically etiologic. According to follow-up letters sent to these 120 patients, nearly two-thirds of the group who answered had suffered recurrences regardless of the method of treatment employed originally. The number of recurrences varied from one to nine and because of this high incidence of recurrence, patients should be so advised. The chief purpose of the treatment should be the relief of symptoms and the simplest and most appropriate treatment for the particular lesion under consideration should be used. The authors believe that while complete removal is desirable, less emphasis should be placed on destruction of the so-called roots of the lesion. 45 references. 4 figures.

The Value of Urinary Sodium Chloride Determinations in Acute Salt Depletion. *Chester W. Morse, Lawson Veterans Hospital, Atlanta, Ga.* South. M. J. 41:1026-29, November 1948.

The diagnosis of acute salt depletion is a difficult one despite its frequent occurrence. It is the purpose of this paper to redirect attention to the large amounts of sodium chloride which may be lost from the gastrointestinal tract or from the skin and to call attention to a simple, roughly quantitative test of urinary sodium chloride excretion which serves as an accurate guide in sodium chloride replacement therapy. The test is quick and simple. The reagents must be protected from contamination and the glassware clean. In a clean dry test tube place one drop of 20 per cent potassium dichromate and 10 drops of the urine to be tested. To this mixture is added drop by drop, the 2.9 per cent solution of silver nitrate. The mixture is shaken after each drop until an end point is reached. This is evidenced by a change in color from bright yellow to brick red. The number of drops of silver nitrate needed to effect this change is the number of grams of sodium chloride expressed in grams per liter. Two cases of acute salt depletion are reported in detail. One was due to severe diarrhea and the other to excessive sweating combined with low salt intake. It is of considerable importance to attempt to correlate the clinical manifestations with the amount of salt deficit. Three degrees of salt depletion are listed: (a) *Light to moderate depletion:*—There is a low con-

centration or absence of chloride in the urine, associated with symptoms of lassitude, giddiness or orthostatic fainting. This indicates a deficit of up to 0.5 Gm. of sodium chloride per kilogram of body weight and requires for an average 70 kilogram man, 4,000 cc. of physiologic saline solution for replacement. (b) *Moderate to severe depletion:*—There is an absence of chloride in the urine with symptoms of lassitude, fainting, anorexia and often nausea and vomiting. There is an associated fall in blood pressure but the systolic pressure is maintained above 90 mm. Hg. This reflects a deficit of 0.5 to 0.7 Gm. of sodium chloride per kilogram and in a 70 kilogram man can be replaced by 4,000 to 6,000 cc. of physiologic saline. (c) *Severe deficit:*—Urine chlorides are absent. The patient is mentally confused and apathetic. There is commonly a history of nausea and vomiting, usually accompanied by severe muscle cramps, carpopedal spasms and sometimes hyperventilation. The blood pressure is less than 90 mm. Hg. This represents a deficit of 0.75 to 1.25 Gm. of sodium chloride per kilogram and requires for replacement 6,000 to 10,000 cc. of physiologic saline.

The more severe degrees of salt and water depletion are easy to recognize when an accurate history can be obtained. In the case reported the mental confusion and apathy obscured the picture. The first patient was stuporous and complained only when the muscle cramps seized him. The history of preceding severe diarrhea was obtained only after persistent questioning. The second patient attributed his pain to "something he had eaten" and it was only after questioning that he said he had worked in the hot sun for several hours before the onset. The diagnosis was clinched in both cases by the finding of low urinary sodium chloride. The simplicity and availability of this test recommends its routine use in all cases of severe diarrhea, vomiting and sweating where the loss of electrolytes may be excessive. 6 references —*Author's abstract.*

ORTHOPEDICS

The Application of Myotomy to Tendon Repair in the Fingers. *Lester Blum, Beekman-Downtown Hospital, New York, N. Y.* Surgery 24:999-1001, December 1948.

Several years ago myotomy was introduced as a maneuver facilitating the repair of divided flexor tendons of the hand. With growing experience it soon became apparent that this procedure possessed several virtues. It not only makes easier the handling of the divided tendon ends by eliminating the usual tension but obviates the danger of disruption of the suture line as well. Finer suture material can be used and early active motion is permissible. This presentation is particularly concerned with the application of myotomy to tendon lacerations in the proximal and middle phalanges of the fingers. This is the area where the worst results are to be expected. Bunnell has discussed the reasons for this and has described his method of handling the problem. With the aid of myotomy, it is possible to treat the situation somewhat differently to attain the objectives. The incision advised by Bunnell is used. It runs from the web to just beyond the distal flexion crease on the

lateral surface of the finger midway between the volar and dorsal aspects. The dissection plane is directed posterior to the volar digital nerve and vessels and exposes the entire extent of the digital flexor sheath, regardless of the location of the wound. The proximal tendon end is sought for and seized with an artery forceps. Every effort is naturally made to disturb the sheath as little as possible. A linear incision is then made just above the wrist and the corresponding muscle belly identified. Where the sublimis tendon is also cut, it is excised, only the profundus being repaired. As much of the distal portion of sublimis tendon is cut away as can easily be delivered into the wound. Following the myotomy, the proximal profundus tendon end is then pulled down toward the point of tendon insertion at the base of the distal phalanx. If the degree of release allows it to reach all the way, the entire distal tendon end is resected and the proximal end is then sutured to the base of the distal phalanx and the attached stump of tendon insertion. Where it is not possible to bring the proximal end this far, less of the distal tendon is resected so that the suture site lies somewhere in the middle phalanx at a point distal to the location of the wound. A cuff of sheath is preserved on the middle phalanx through which the tendon is passed. The finger can be splinted postoperatively in extension with slight flexion at the wrist. The advantage of avoiding a bulky tendon suture at the site of injury of the sheath, surrounding tissues and skin is obvious. Three case reports are presented. 4 references. 2 figures.—*Author's abstract.*

OTORHINOLARYNGOLOGY

The Use of Streptomycin in Tuberculous Tracheobronchitis. *John J. O'Keefe, Philadelphia, Pa.* Ann. Otol., Rhin. & Laryng. 57:784-90, September 1948.

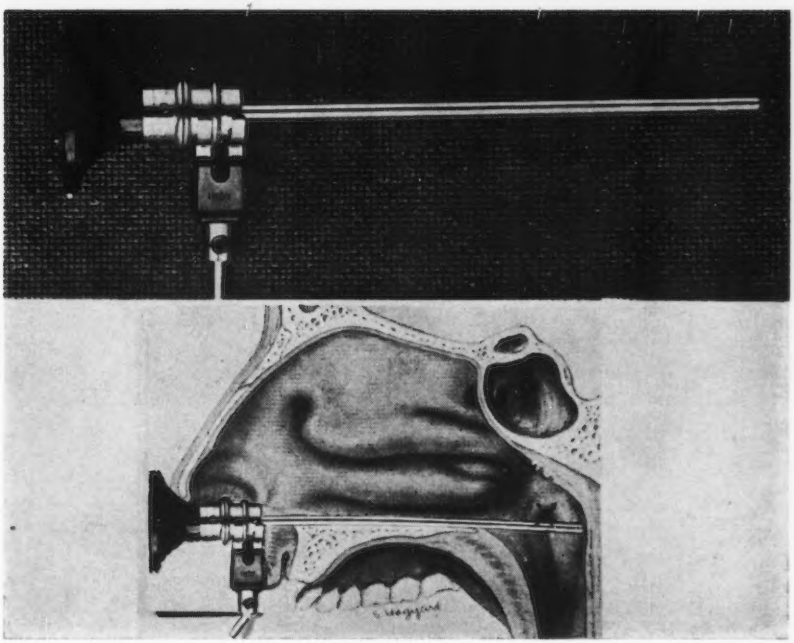
In the selection of patients, two criteria were used: bronchoscopic evidence of mucosal disease as manifested by persistant ulcerations, granulations and stenoses; and/or roentgen signs of obstructive phenomena as seen in atelectasis or in the ballooning of cavities following collapse measures. All patients necessarily were proved tuberculous. Accordingly, a total of 62 patients were selected for study. Of these, 44 satisfied the bronchoscopic requirements, 18 additional evidencing roentgen signs of bronchial obstruction. Eleven patients received streptomycin by aerosol alone, 15 by the concomitant aerosol and parenteral administration method and 36 by parenteral administration alone. Aerosol solution consisted of 50 mg. of drug in 1 cc. of sterile isotonic saline, administered by nebulization every two hours, for a total daily dose of 500 mg. Parenteral dosage consisted of the intramuscular injection of 500 mg. twice daily. The results observed, both bronchoscopically and roentgenographically, have been significant. Regression and repair of bronchial lesions have progressed often with dramatic rapidity and relief of obstructive signs has allowed for early collapse therapy. These results indicate the necessity of adequate streptomycin dosage: both the parenteral administration method alone, and the aerosol method alone, are insufficient, though

not ineffective. The concomitant parenteral-aerosol method of administration appears to be the method of choice. 5 references. 3 tables. 2 figures.—*Author's abstract.*

New Concepts in the Application of Radium to the Nasopharynx. *John S. Mikell, Tucson, Ariz.* Arizona Med. 5:29-37, September 1948.

The summarization of 3,600 radium treatments given to 750 patients reveals interesting new concepts in the treatment of conditions caused by infected hypertrophic lymphoid tissue in the nasopharynx. To determine the necessity for this treatment the nasopharynx is studied by the nasopharyngoscope illustrated in slide I.

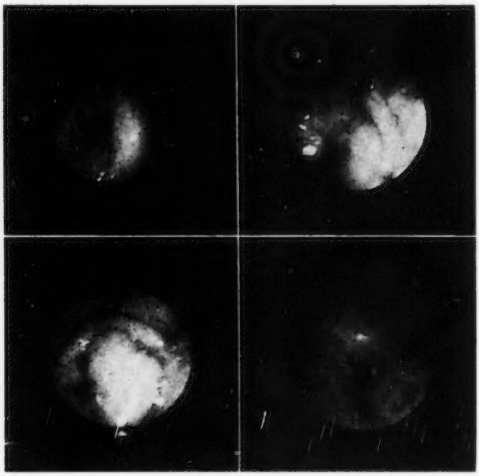
Photographs taken through the nasopharynx (*Hendrix, J. E. and Lieberman, A. T. Ann. Otol., Rhin. & Laryng. 54:662-83, December 1945*) appear in slide II. In the photograph on the left is a normal tubal orifice. In the other photograph the orifice is occluded by hypertrophic lymphoid



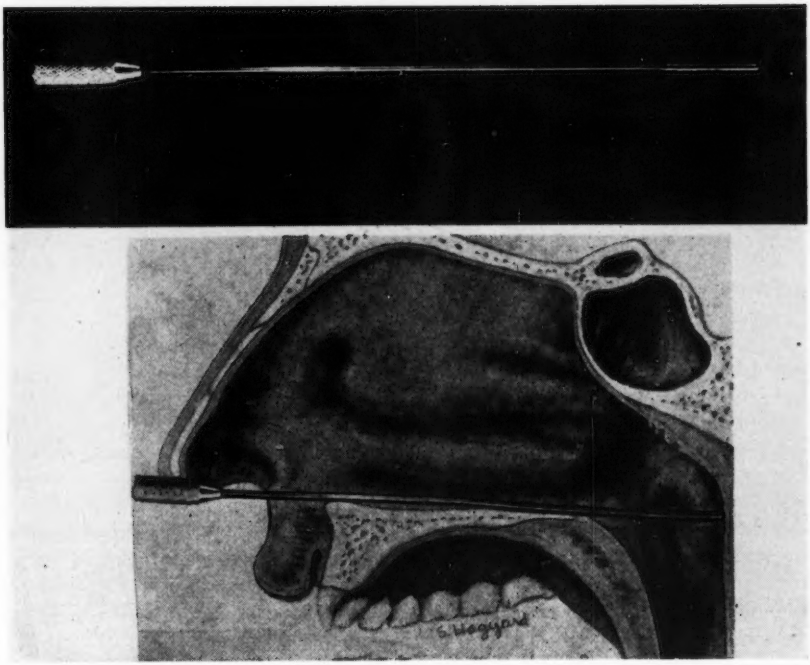
Slide I

tissue. When radium is the treatment of choice, the Monel metal nasal radium applicator (Burnham-Crowe) is passed along the floor of the nose until it rests against the postnasopharyngeal wall, placing the radium capsule in contact with the infected lymphoid tissue, (Slides III and IV).

Irradiation, by decreasing the lymphoid tissue, removes the mechanical obstruction and permits proper function of the eustachian tube and the



Slide II



Slide III

Slide IV
By courtesy of Arizona Medicine

middle ear; it also eliminates the crevices which are the habitat of infectious organisms. The results obtained in children showing a conductive type of hearing loss are spectacular and the personality changes very remarkable. This procedure should be considered routine in all schools for the hard-of-hearing. It is one of the most fundamental and essential measures in the treatment and prevention of acute, recurrent and chronic otitis media. Out of 33 patients with vertigo, having such pathology about their tubal orifices, 22 were completely relieved and 5 greatly modified. Of 18 patients complaining of a thumping sensation in their ears, who had offending tissue which could cause an arterial compression, 12 were completely relieved and 6 improved. Use of radium in the control of aerotitis was proved by the work done in the Army Air Forces *(Ann. Otol., Rhin. & Laryng. December 1945)*. The nasopharynx is one of the most frequent and treacherous foci of infection encountered. One hundred and thirty-six cases of chronic nasopharyngitis were treated and of these 109 were relieved of all symptoms. Elimination of this focus may help in the prevention of acute rheumatic fever and act as a possible factor in the preventon of flare-ups in quiescent cases. Arthritic patients with an infection in this tissue should also be considered as candidates for radiation. Removal of the irritation to nerve centers located in this area often will give relief to multiple complaints relating to the ears, throat, neck and to occipital headaches. Many children having allergic nasal membranes, chronic sinusitis and infected hyperplastic tissue have been given considerable relief. The results obtained in adults with an established hearing loss or tinnitus have been unsatisfactory but in the administration of the 3,600 treatments, only 2 patients complained of increased subjective symptoms and no harmful objective results were observed. 14 figures.—*Author's abstract.*

OPHTHALMOLOGY

Methyl Alcohol Poisoning. *Samuel S. Altshuler (Major, M.C., A.U.S.).* M. Bull. Off. Chief Surgeon European Command 5:1, May 1948.

Methyl alcohol is broken down into formic acid and formaldehyde in the tissues and not fully oxidized. Intoxication disturbs the acid base metabolism, causing a serious acidosis and frequently results in blindness or death. Treatment is based on correction of the severe acidosis by administration of large doses of sodium bicarbonate intravenously. The blood carbon dioxide combining power is determined and four 40 cc. ampules of sodium r-lactate molar solution immediately administered intravenously in 1 liter of isotonic saline solution. Doses of 250 cc. of 5 per cent sodium bicarbonate freshly prepared for intravenous use may be substituted if sodium lactate is not immediately available. Sodium bicarbonate 4 Gm. is given orally every fifteen minutes for four doses. It is given by stomach tube to comatose patients. The blood carbon dioxide combining power is rechecked and the intravenous and oral sodium lactate and bicarbonate repeated until the combining power equals 40 to 50 volumes per cent or the urine *p*H becomes 7.0. The urine is checked twice daily and sodium bicarbonate 2 Gm. is given every hour orally if the *p*H is less than 7.0 or every two hours if between 7.0 and 7.8. The sodium bicarbonate is stopped if the *p*H remains at 7.8. This treatment is continued for four or five days. The eyes should be covered if there are any visual or retinal changes and kept covered until evidence of ocular disturbance has disappeared. 2 references.

The Siniscal Lid Plate. A New Instrument. *Arthur A. Siniscal, Missouri Trachoma Hospital, Rolla, Mo.* Am. J. Ophth. 31:1303-1305, October 1948.

This is a new instrument for retracting the upper or lower eyelid during entropion and other (ptosis, trichiasis) operations. It may also be used to widely expose the cul-de-sacs for removal of deeply imbedded foreign bodies of the conjunctiva. The important features of this instrument are that it is easy to use, it will keep the eyelid well reflected for surgical procedures without tearing delicate lid tissues, and that it will remain in situ during surgery without slipping or sliding as in the older type instrument (lid forceps). The new instrument is an outgrowth of the old trachoma forceps which made use of a biting or toothed tip that pressed on the lid margin for traction and which tore into conjunctival tissue at the same time. A traction suture is inserted into the center of the ciliary margin of the eyelid and entwined about the binding post on the handle of the new instrument; thus affording firm fixture of tissue with a minimum of trauma to the lid structure and of discomfort to the patient. A large blade or plate with a concave (instead of convex, as in all older instruments of this type) edge forms the essential feature of the new instrument; the concave margin more readily adapts itself to the convexity of the eyeball and because of its wider spread can reach into the corners of the lid and afford better counterpressure. The new lid plate is used routinely for entropion operations and also for electrolytic epilation, for tarsectomy and tarsorrhaphy, for the removal of foreign bodies, the Blas-

covics type of ptosis operation, the removal of subtotal symblepharon and for other uses as the ophthalmic operator may see fit. 2 references.—*Author's abstract.*

Sympathetic Ophthalmitis. *C. K. Bhalerao, Raipur, India.* Antiseptic 45:377-80, June 1948.

This is a specific bilateral inflammation of unknown etiology and affecting the entire uveal tract. It first appears in the injured or exciting eye a variable time after injury and soon afterwards in the sound or sympathizing eye. The disease incidence is decreasing because of improved surgical treatment of eye injuries. Perforating wounds, especially when the foreign body remains in the eye, seem responsible for about 65 per cent of cases, operative wounds another 25 per cent, and scleral rupture, perforating corneal ulcers and intraocular tumors the remaining 10 per cent. Inflammation usually develops between the fourth and eighth week after injury and will probably not appear after three months, though the possibility of its appearance is indefinite. There are 2 theories of origin of sympathetic ophthalmitis: infective and allergic. The former has not been confirmed bacteriologically but the granulomatous nature of the inflammation and its general resemblance to tuberculosis has suggested a tubercular infection. The lymphocytic infiltration suggests that the condition may be a lymphocytic uveomeningitis caused by a filterable virus but this also is unconfirmed. The allergic theory has little support, general opinion regarding the disease as of infectious origin, probably a virus. The route of infection from the exciting eye is believed to be the blood stream. Symptoms are a persistent, low grade uveitis in the exciting eye with redness, injection, irritability, tenderness, pain and lachrimation. Onset is insidious in the sympathizing eye with obscured vision, lachrimation, circumcorneal congestion and indications of irido cyclitis. Keratitis precipitates develop in either or both eyes, followed by haziness of the vitreous, adhesions between the iris and lens and later choroiditis. The disease is chronic with a tendency to relapse. The eyeball becomes shrunken and should be enucleated to prevent relapse. Early diagnosis is essential if vision is to be saved in at least one eye. It is based upon the early appearance of free floating particles in the aqueous and vitreous which are deposited behind the cornea. Sympathetic ophthalmitis may be excluded if these are absent. Treatment is atropine drops and ointment from the beginning, paracentesis being performed but the atropine not stopped if increased tension develops. Salicylates and mercury inunctions have been tried, the former being preferred. Injections of diphtheria antitoxin 20,000 units daily, typhoid vaccine and milk have been useful. Early enucleation of the exciting eye is the best way of saving the other. If the sympathizing eye is already involved, symptomatic treatment is used until the inflammation subsides and then the eye having the poorest vision is enucleated. 2 references.

MISCELLANEOUS

COMMENTS CONCERNING THE BRITISH NATIONAL HEALTH SERVICE

National health service in England started with passage by Parliament of the Health Insurance Act before World War I but a real change in the lives of British citizens occurred July 5, 1948, when the present National Health Service Act became effective. This entitles everybody in the country to free medical treatment at government expense. Nobody is required to accept it and both general and specialist private practice may continue but about 95 per cent of the population have enrolled on doctor's lists. This is about twice the number of people previously beneficiaries of some health insurance. Those who have not done so are chiefly the elderly or the financially well-off who do not desire to be placed on a level with the working class and believe that they will receive better treatment as private patients. The scheme is so popular that no political party would seriously consider opposing it. Though the idea was originally bitterly opposed by the British medical and dental professions, the majority have now bowed to the inevitable and about 87 per cent of the physicians, 90 per cent of the dentists, and practically all the pharmacists in England and Wales, and even more in Scotland, had joined the scheme at the beginning of 1949. More than 2,500 hospitals have been transferred to government control and are now operated under charge of Regional Hospital Boards. This is not actually free medical and dental service as self-employed and unemployed men pay 20 cents and women 16 cents weekly to national insurance while working men and women over 18 contribute about 95 cents and 80 cents each to national insurance. Of this, 17 cents from men's and 13 cents from women's contributions are allotted to the National Health Service. Every person however contributes either directly or indirectly through rates and taxes and is entitled to use the service whether or not enrolled. In favor of the service, it has been reported that both doctors and patients are pleased with it and that fears for the patient's freedom to choose his own doctor have been found groundless. The service has worked quite well for its first half year and has had few criticisms. The chief difficulty has been a shortage of doctors, nurses and hospital beds. Patients probably have a greater choice of doctors than before under the national insurance scheme. A patient may change his doctor whenever and as frequently as desired. The chief difference is that the doctor is paid by the government instead of the patient. Nobody now worries about doctor's bills, the cost of a hospital bed or operation. There has been a tremendous demand for spectacles and dentures. Mothers and housewives have probably been the chief beneficiaries. Many previously untreated chronic illnesses in women, children and old people have been brought to light. Comprehensive maternity care is provided, including articles of special diet for expectant mothers under the Welfare Foods Scheme. An extensive network of prenatal and postnatal clinics and infant welfare centers has been established. Special attention is paid these and other health centers because a chief objective of the National Health Service is the prevention rather than the cure of illness.

The general population believes that the very considerable cost of National Health Service is warranted by the improved health and productivity of the nation.

Objections to the National Health Service voiced by the doctors are chiefly underpayment and deterioration of medical practice standards because of overwork, patients with trivial complaints clogging clinics and doctor's offices and impeding treatment of more seriously ill patients. It is natural for people to ask for anything free. Finding 60 patients in a doctor's consultation room is common but about half are not really ill and only come for free treatment and free medicine. The doctors are glad that many who could not formerly afford medical care now have it but the deserving cases often suffer. Doctors no longer have time for careful diagnosis and are in danger of killing themselves. House calls formerly took about ten minutes but now frequently require a half-hour or more because the doctor is asked to examine the entire family in addition to the patient. Stacks of office forms and records are required. Ministry of Health rules and regulations must be carefully studied. If a prescription is issued for something not on the latest free list from Whitehall, the patient receives the medicine but the doctor must pay the bill. Nursing and secretarial aid is totally inadequate and as yet there are no signs of the local health centers which were supposed to fill these needs. Construction of these centers has been postponed because of scarcity of building materials and labor. The average general practitioner is forced to rely upon his wife for secretarial help in addition to her family and household work.

The average doctor is supposed to have between 2,000 and 3,000 patients but he may have up to 4,000. Fees for 2,000 patients total about $6,400. annually, some 30 per cent of which must be used for expenses, leaving about $4,000. on which income tax must be paid. His income is therefore so inadequate that he cannot live or educate his children commensurately with the service he provides. Though doctors were assured that they could continue doing private practice if they so desired, private patients have largely disappeared because, while many patients would prefer to avoid the crowds in doctor's offices, they do not desire to also pay for drugs, etc. which everybody else receives free. The general public gains by free dentures, free spectacles, etc. but they will find that their doctors are becoming overworked and tired civil servants more responsible to the government than to the patients. It is felt that ultimate disaster can only be avoided by major amendments of the National Health Service Act. Dictatorial powers of the Ministry of Health must be so limited that the doctor again has the opportunity to give his patients adequate service in accordance with the dictates of his conscience and not the directions of the ministry. Two suggestions to prevent unnecessary crowding for treatment are to require patients to pay a small sum for the doctor's services in addition to their weekly contribution and to increase the capitation fee for the first 1,500 patients. The high cost of so-called "free" medical care is illustrated by the fact that it was necessary to appropriate £58,455,000. in addition to the £161,000,000. available when the National Health Service Act became effective.

MEDICAL LEGISLATION

by

GERALD G. GROSS

Editor, Washington Report on the Medical Sciences

Congress, striving diligently to develop a broad national health program, finds itself confronted with a multiplicity of "plans." A year ago, the problem was relatively simple. The choice lay simply between two sharply defined and contrasting proposals: Compulsory national health insurance, as set forth in the Murray-Wagner-Dingell bill, and decentralized Federal assistance to the States, espoused by Senator Robert A. Taft, of Ohio. Neither made any legislative headway before the 80th Congress died. Today not only are these two plans, each modified somewhat, again demanding consideration in the halls of Congress but they have been joined by a number of others.

The American Medical Association, which previously had advanced no alternative system of its own, has put forth a 12-point national health platform designed to obviate compulsory insurance. Dr. Paul B. Magnuson, emphasizing that he was acting in his private role as a physician rather than as chief medical director of Veterans Administration, is publicly advocating a Federal-State supported program of nationwide diagnostic clinics as an effective, positive means of staving off Murray-Wagner-Dingell. Senate Democratic dissenters to President Truman's recommendation of a federalized system of medical care are rallying around an alternative bill of their own. Republican Senator Henry Cabot Lodge, of Massachusetts, would resolve the issue by having Washington appropriate money to the several States, on a dollar-for-dollar matching basis, to be used for providing the medically indigent with laboratory diagnostic and roentgen ray services, respirators and the more costly drugs. Still another proposal under Congressional study is to have Federal funds appropriated to meet medical and hospital bills in excess of a certain percentage of the annual income of a family head or individual. There are many more. And in addition there are the various plans, some of which are incorporated in the omnibus program recommended by A.M.A., which certain sponsors believe to be sufficient unto themselves in meeting national health needs. Foremost among them, perhaps, is expansion and strengthening of local public health units throughout the land. Its supporters feel that we are entering upon an era of preventive medicine and argue convincingly that the problem of medical care can and would be materially lessened if more attention, backed up with sufficient funds, were paid to that aspect. Similarly strong cases are being presented in behalf of hospital expansion; of Federal aid to medical, dental, nursing and allied professional education; of greater governmental support of medical research.

Announced in February, the A.M.A. 12-point program is now well

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The Washington Institute of Medicine assumes no responsibility for opinions expressed or conclusions drawn by the author.

known. Less publicized, however, are the Magnuson and Lodge plans and a brief description of each might be given at this point, inasmuch as either or both may be ultimately embraced by Congress. Establishment in every State of diagnostic clinics, accessible to the population and expertly staffed—this is what Dr. Magnuson advocates. Financial support would be by the Federal, State and local governments, as well as by private philanthropy. Services would be on a free, part-pay or full rate basis, depending on the patient's economic status as determined by a local representative board. Treatment, as distinguished from diagnostic care, would be by the private physician as at present, with provision made for deficit payments from government appropriations. It is Dr. Magnuson's idea that the diagnostic clinics be set up in existing facilities wherever possible. Also, that supervision and maintenance of high professional standards be entrusted to medical schools in the area. "The subsidized medical examinations," says Dr. Magnuson, "would substantially reduce medical costs for the moderate income families and make it possible for any income group to get the service now open only to the wealthy. The patient would be able to obtain a thorough and complete diagnosis, so necessary to really adequate medical care and disease prevention but a course which most patients shy away from because of the expense involved. While reducing costs, the free medical examinations would also raise community health standards by making available diagnostic facilities not readily accessible to the general practitioner; by providing high type consultation for the general practitioner; by making it possible for the average patient to get proper diagnoses and, therefore, proper treatment, and by providing the family physicians opportunity for close contact with the most up to date medicine."

Salient features of Senator Lodge's proposal, which he is resolved to battle through the Capitol, are as follows: (1) General administrative authority would be placed in the hands of the Surgeon General, U. S. Public Health Authority but the States and local governments would be empowered to decide which applicants were eligible for free drugs, respirators, X-rays and laboratory diagnostic services and which were not. (2) In order to qualify for Federal subsidization, a State would have to formulate its plan and have it approved by the Surgeon General, guarantee matching of funds, designate an administering agency and make provisions of the program applicable to all political subdivisions of the State. (3) Medical aid is defined as "X-ray services, laboratory diagnostic services, respirators and any drug which is of substantial, accepted and specific value in the treatment or prevention of pneumonia, streptococcus infection, diabetes, pernicious anemia and other anemias, congestive heart failure, glandular and nervous disorders, nutritional deficiency, typhoid fever and such other infectious or chronic diseases as the Surgeon General may from time to time prescribe."

As if this problem of national health legislation were not complicated enough, the picture is further clouded by impending reorganization of the armed forces' medical departments and recommendations by the Hoover Commission on consolidation of Federal hospitals, including those of Army, Navy and Veterans Administration. Without discounting the part that

political considerations will play in whatever solution is eventually achieved, it is nevertheless a fact that most of the members of Congress conscientiously desire to do what they think will be best for the greatest numbers. Will transfer of service and veterans hospitals to a new national health agency, as proposed to Congress, work hardship to soldiers' dependents, to combat-scarred veterans, to the advancement of medical research? With the admitted shortage of medical manpower in this country, is the output of doctors in danger of being curtailed if a single, unified medical department for Army, Navy and Air Force is established, possibly interfering with the military's present intern and residency training programs? Senators and Representatives are concerned about these and a host of other questions. They recognize that all are interrelated and that no single factor can be considered independently of the others. Which way the majority will turn is still undecided, the only thing that is reasonably certain being that some very broad, important health and medical legislation will be enacted.

* * *

POPULATION BY BROAD AGE GROUPS, FOR THE UNITED STATES FOR 1945 AND FORECASTS 1950 TO 1970

MEDIUM FERTILITY—MEDIUM MORTALITY—500,000 NET IMMIGRATION PER FIVE YEARS

	Population in Thousands						Per Cent Distribution				
Year	All Ages	Under 5 Years	5–19 Years	20–24 Years	45–64 Years	65 Yrs. & Over	Under 5 Years	5–19 Years	20–44 Years	45–64 Years	65 Yrs. & Over
1945	139,261	13,147	33,648	54,186	28,530	10,110	9.4	24.1	38.8	20.4	7.2
1950	145,959	12,150	35,910	56,081	30,685	11,193	8.3	24.6	38.4	21.0	7.7
1955	150,911	11,199	38,127	56,390	32,603	12,592	7.4	25.3	37.4	21.6	8.3
1960	155,075	10,866	38,662	56,808	34,746	13,993	7.0	24.9	36.6	22.4	9.0
1965	159,055	11,137	36,311	59,411	37,015	15,181	7.0	22.8	37.4	23.3	9.5
1970	162,888	11,447	35,288	60,336	39,411	16,404	7.0	21.7	37.0	24.2	10.1

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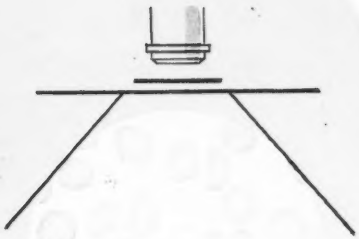


The Blood Picture Responds More Quickly

While iron is essential for hemopoiesis, recent findings give evidence of the important role in blood formation played by B-complex vitamins and certain factors occurring in fresh liver concentrate. This approach may be considered as "Supported Therapy," from which rapid correction of both the blood picture and the systemic manifestations of anemia may be expected.

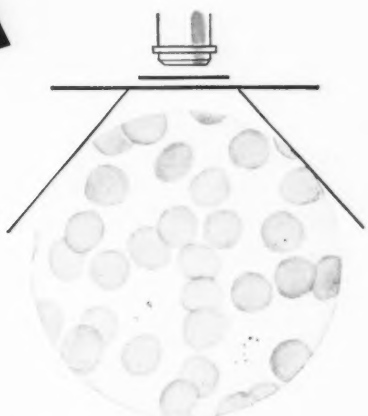
Livitamin with Iron is indicated in hypochromic anemias regardless of origin and routinely during pregnancy and lactation. Its liquid form and palatable taste make it especially valuable for administration to children. Adult dose, 3 to 4 teaspoonfuls 3 times daily.

LIVITAMIN WITH IRON

This is the Formula:

Each fluidounce of Livitamin with Iron, prepared with an attractive, palatable vehicle, presents:

Iron and Manganese Peptonized..30 gr.
(Equiv. to 45 mg. elementary Iron)
Iron Peptonized, N.F.....12½ gr.
(Equiv. to 140 mg. elementary Iron)
Thiamine Hydrochloride (B_1)..10 mg.
Riboflavin (B_2, G).....5 mg.
Nicotinamide (Niacinamide)...25 mg.
Pyridoxine Hydrochloride (B_6)..1 mg.
Pantothenic Acid.....5 mg.
Liver Concentrate 1:20.....45 gr.
(Represents 2 oz. fresh liver)
Rice Bran Extract.....15 gr.



THE S. E. MASSENGILL COMPANY
Bristol, Tenn.-Va.
NEW YORK · SAN FRANCISCO · KANSAS CITY

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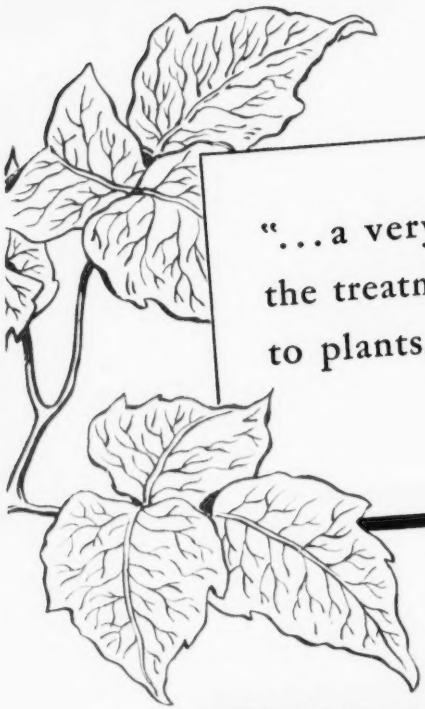

"...a very valuable adjunct to the treatment of dermatitis due to plants, especially

POISON IVY..."(1)

PYRIBENZAMINE cream or ointment

Applied locally, Pyribenzamine hydrochloride usually gives prompt and prolonged relief from itching in dermatitis venenata due to poison ivy, oak or sumac.

Pyribenzamine has also been found to give relief to the majority of patients with other itching dermatoses, "particularly atopic dermatitis and pruritus ani."[2]

"In many instances the local skin conditions are, of course, more rapidly and more completely eradicated by the combined topical and oral administration of this drug."[1]

1. Carrier, R. E., Krug, E. S., and Glenn, H. R.: J. Lancet, 68: 240, June 1948.
2. Feinberg, S. M. and Bernstein, T. B.: J. of A.M.A., 134: 10, July 1947.

PYRIBENZAMINE CREAM, 2 per cent (water-washable base), jars of 50 Gm. and 1 pound; Ointment, 2 per cent (petrolatum base), jars of 50 Gm. and 1 pound.

Ciba PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

PYRIBENZAMINE (brand of tripelennamine) — Trade Mark Reg. U.S. Pat. Off.

2/1417M